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National
Voluntary
Laboratory
Accreditation
Program

Commercial Products Testing

Lawrence I. Knab

NIST HANDBOOK 150-16

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[1]At Boulder, CO 80303.
[2]Some elements at Boulder, CO 80303.

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National Voluntary Laboratory Accreditation Program

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Lawrence I. Knab

July 1995

U.S. Department of Commerce
Ronald H. Brown, Secretary

Technology Administration
Mary L. Good, Under Secretary for Technology

National Institute of Standards and Technology
Arati Prabhakar, Director

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PREFACE

NIST Handbook 150-16 presents the technical requirements of the National Voluntary Laboratory Accreditation Program (NVLAP) for the Commercial Products Testing (CPT) accreditation program. It is intended for information and use by staff of accredited laboratories, those laboratories seeking accreditation, other laboratory accreditation systems, users of laboratory services, and organizations needing information on the requirements for accreditation under the CPT program.

This publication supplements NIST Handbook 150, *NVLAP Procedures and General Requirements,* which contains Part 285 of Title 15 of the U.S. Code of Federal Regulations (CFR) plus all general NVLAP procedures, criteria, and policies. The criteria in NIST Handbook 150 encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987). Handbook 150-16 contains information that is specific to the CPT program and does not duplicate information contained in the Procedures and General Requirements. The numbering of the sections of this handbook is patterned after Handbook 150; for example, Section 285.3 of Handbook 150 presents the description and goal of NVLAP, whereas Section 285.3 of Handbook 150-16 presents the description of the CPT program. Where there is no material specific to the field of accreditation, the section number is omitted.

Questions or comments concerning this handbook should be submitted to the National Institute of Standards and Technology/NVLAP, Building 411, Room A162, Gaithersburg, MD 20899; phone (301) 975-4016; fax (301) 926-2884; e-mail nvlap@enh.nist.gov.

ACKNOWLEDGMENTS

The technical requirements for the Commercial Products Testing (CPT) program in this handbook were developed as a revision and update of the previous CPT handbook, "Commercial Products Laboratory Testing Accreditation," that was prepared and distributed as a draft NBSIR, February 1991; that handbook was a revision of NBSIR 85-3171.

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SUMMARY

Any laboratory (including commercial, manufacturer, university, or federal, state, or local government laboratory) that tests in accordance with the applicable standard test methods may apply for NVLAP accreditation in the Commercial Products Testing (CPT) program. Accreditation will be granted to a laboratory that satisfactorily meets the conditions for accreditation defined in NIST Handbook 150, *NVLAP Procedures and General Requirements*, which contains Title 15, Part 285 of the Code of Federal Regulations. These conditions include satisfactory performance in selected proficiency testing as required, and fulfilling the on-site assessment requirements, including resolution of identified deficiencies. The names of NVLAP-accredited laboratories are published in the NVLAP annual directory and other media to which information is regularly provided.

Testing services covered: The scope of the CPT program covers standard test methods for Paints and Related Coatings and Materials, Paper and Related Products, Plastics, Plumbing (Plastics and Fixtures), and Building Seals and Sealants given in the Test Method Selection List (Appendix D).

Period of accreditation: One year, renewable annually.

On-site assessment: Visit by a technical expert to determine compliance with the NVLAP criteria before initial accreditation and every two years thereafter. Additional monitoring visits as required.

Assessors: Technical experts with experience in testing of paints, paper, plastics, plumbing, and seals/sealants.

Proficiency testing: In the fields of Paper and Plastics, each laboratory is required to test and analyze proficiency testing sample material(s) for specific test methods supplied by a proficiency testing contractor. Advance notice and instructions are given before testing is scheduled. A summary of results will be sent to the participants and to NVLAP.

For the fields of Paints, Plumbing (Plastics and Fixtures) and Building Seals and Sealants, NVLAP will initiate proficiency testing when a sufficient number of laboratories have enrolled. Laboratories will be advised in advance of the effective date by which they must participate.

Granting accreditation: Based upon satisfactory on-site assessment and resolution of deficiencies, and proficiency testing, and technical evaluation of applicable laboratory information. A Certificate and Scope of Accreditation are issued.

Fees: Payments are required as listed on the fee schedule, including the administrative/technical support fee, on-site assessment fee, proficiency testing fee (if appropriate), and test method fee.

Sec. 285.1 Purpose

The purpose of this handbook is to set out procedures and technical requirements for NVLAP accreditation of laboratories which perform test methods covered by the Commercial Products Testing (CPT) program. It complements and supplements the NVLAP programmatic procedures and general requirements found in NIST Handbook 150. The interpretive comments and additional requirements contained in this handbook make the general NVLAP criteria specifically applicable to the CPT program. The quality system requirements are designed to comply with the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002.

Sec. 285.2 Organization of procedures

(a) The procedures described in this handbook are organized to cross-reference with NIST Handbook 150, *NVLAP Procedures and General Requirements*.

(b) In addition, the handbook contains six appendices:

(1) Appendix A provides examples of a Certificate of Accreditation and a Scope of Accreditation for the Commercial Products Testing program;

(2) Appendix B provides the General Operations Checklist, which NVLAP assessors use during an on-site technical assessment to evaluate a laboratory's ability to conduct testing in general;

(3) Appendix C provides the Specific Operations Checklists, which NVLAP assessors use during an on-site technical assessment of a laboratory that tests paints, paper, plastics, plumbing, or seals/sealants;

(4) Appendix D lists the standard test methods and their accompanying NVLAP Test Method Codes for the CPT program as given on the NVLAP Test Method Selection List;

(5) Appendix E gives a description of a critical element summary for use by NVLAP assessors for uniformly and objectively conducting on-site technical assessments; and

(6) Appendix F presents the sheets that the assessor completes in conducting a test method review during on-site assessments.

Sec. 285.3 Description of Commercial Products Testing program

The NVLAP program for Commercial Products Testing provides for laboratory accreditation to assure that standard test procedures for paints, paper, plastics, plumbing, and seals/sealants are performed properly. The CPT program uses standard test methods, listed in Appendix D, from the American Society for Testing and Materials (ASTM), American National Standards Institute (ANSI), American Society of Mechanical Engineers (ASME), Technical Association of the Pulp and Paper Industry (TAPPI), and the General Services Administration (GSA).

In 1984, the CPT program was established at the request of the International Coalition for Procurement Standards (ICPS). The program identified standards and test methods for paints and related coatings, paper and related products, and mattresses. The program was developed to enable purchasing authorities to specify in their purchase contracts that vendors use accredited laboratories for product testing.

In 1985, the Building Seals and Sealants LAP was established in response to a request from ASTM Committee C-24 Building Seals and Sealants. The Building Seals and Sealants LAP was subsequently added to the CPT program, and the Plastics field was added to the CPT program in 1988. In 1990, the Plumbing field was added to the CPT program in response to a request from the California Energy Commission.

Sec. 285.4 References

(a) The following documents are referenced or cited in this handbook:

(1) ISO/IEC Guide 25, *General Requirements for the Competence of Calibration and Testing Laboratories*, and ISO 9002, *Quality Systems—Model for Quality Assurance in Production and Installation*; available from:

American National Standards Institute
(ANSI)
11 West 42 Street, 13th Floor
New York, NY 10036

Order Phone: (212) 642-4900
Order Fax: (212) 302-1286;

(2) NIST Handbook 150, *NVLAP Procedures and General Requirements*; available from:

NIST/NVLAP
Building 411, Room A162
Gaithersburg, MD 20899

Phone: (301) 975-4016
Fax: (301) 926-2884.

(b) The most recent publication of the standard(s) for the test method(s) for which the laboratory is accredited shall be available as reference(s). For the CPT program, the standards given in Appendix D may be obtained from:

(1) American Society for Testing and Materials (ASTM)
1916 Race Street
Philadelphia, PA 19103-1187

Phone: (215) 299-5400
Order Fax: (215) 977-9679;

(2) Technical Association of the Pulp and Paper Industry (TAPPI)
15 Technology Parkway South
Norcross, GA 30092

Phone: (800) 332-8686
Order Fax: 404/446-6947;

(3) ANSI [see (a)(1) above for address and phone numbers];

(4) The American Society of Mechanical Engineers (ASME)
22 Law Drive
Fairfield, NJ 07007

Order Phone: (800) 843-2763
Order Fax: (201) 882-1717;

(5) General Services Administration (GSA)
Federal Supply Service Bureau
470 East L'Enfant Plaza, SW
Suite 8100
Washington, DC 20407

Order Phone: (202) 755-0325 or 755-0326
Order Fax: (202) 205-3720.

Sec. 285.5 Definitions

Coating (paint): A liquid, liquefiable or mastic composition that is converted to a solid protective, decorative, of functional adherent film after application as a thin film. [ASTM D16-93a]

Critical elements: A compilation of summary statements of the key provisions of a standard test method that guides individual assessors in applying a common objective assessment of a laboratory's ability to conduct tests.

Paperboard (paper): One of two broad subdivisions of paper (general term), the other being paper (specific term). The distinction between paperboard and paper is not sharp but, broadly speaking, paperboard is heavier in basis weight, thicker and more rigid than paper. In general, all sheets 12 points (0.012 in., 3.0 mm) or more in thickness are classified as paperboard. [ASTM D1968-93e]

Plastic(s): A material that contains as an essential ingredient one or more organic polymeric substances of large molecular weight, is solid in its finished state, and, at some stage in its manufacture or processing into finished articles, can be shaped by flow. [ASTM D883-93]

Plumbing (plastics, fixture fittings and fixtures): The apparatus (as pipes and fixtures) concerned in the distribution and use of water in a building. [Webster's Ninth New Collegiate Dictionary, 1990]

Quality assurance: All those planned and systematic actions necessary to provide adequate confidence that a product or service will satisfy given requirements for quality. [ISO 8402:1994]

Quality control: The operational techniques and activities that are used to fulfill requirements for quality. [ISO 8402:1994]

Seal: In building construction, a barrier against the passage of liquids, solids, or gases. [ASTM C717-93]

Sealant: In building construction, a material that has the adhesive and cohesive properties to form a seal. [ASTM C717-93]

Sec. 285.6 NVLAP documentation

(a) Test Method Selection List

(1) Depending on the breadth of its testing capabilities, a laboratory may seek accreditation to all or only selected methods offered in the CPT program. The Test Method Selection List, provided to the laboratory seeking accreditation as part of the NVLAP application package, lists the methods that comprise the program.

Appendix D lists the test methods currently available for accreditation in one of five following fields under the CPT program. This list is updated periodically and is available from NVLAP.

(i) Paints and Related Coatings and Materials;

(ii) Paper and Related Products;

(iii) Plastics;

(iv) Plumbing (Plastics and Fixtures); and

(v) Building Seals and Sealants.

(2) Within the scope of the Paints and Related Coatings and Materials field, the test methods include:

(i) Physical Properties;

(ii) Performance and Performance Change;

(iii) Chemical Properties and Composition; and

(iv) Test Sample Conditioning and Preparation.

(3) Within the scope of the Paper and Related Products field, the test methods are divided into five categories:

(i) Paper and Paperboard;

(ii) Permanent Record Papers;

(iii) Pressure Sensitive Tapes;

(iv) Packaging and Packaging Materials (including Corrugated Board); and

(v) Pulp.

(4) The scope of the Plastics field includes the physical, environmental, and stabilization properties of plastics.

(5) In Plumbing, the test methods are divided into five categories:

(i) Plastics-Manufactured Plumbing Products;

(ii) Plastic Water Closet Fixture Performance;

(iii) Fixtures;

(iv) Vitreous China Plumbing Fixtures; and

(v) Hydraulic Performance for Water Closets and Urinals.

(6) The scope of the Building Seals and Sealants program includes caulking compounds (sealants), putty, elastomeric compounds, glazing compounds, preformed gaskets, sealing tapes for joint application, and membranes and liquid applied elastomeric sealing compounds for surface application.

(7) A laboratory may request to have test methods added which are not listed in Appendix D. Any test method additions will be handled in accordance with NVLAP procedures for adding to or modifying an established LAP (see Handbook 150, Sec. 285.18).

(b) Checklists

Checklists contain definitive statements or questions about all aspects of the NVLAP criteria for accreditation. NVLAP programs incorporate two types of checklists:

(1) The NVLAP General Operations Checklist addresses factors applicable to evaluating a laboratory's ability to conduct testing in accordance with the procedures and general requirements for accreditation. The factors include, but are not limited to, the laboratory's

organization, management, and quality system in addition to its testing competency.

The General Operations Checklist, presented in Appendix B, is numbered to correspond to the requirements in NIST Handbook 150. The comment sheets are used by the assessor to explain findings and deficiencies noted on the checklist, as well as to make comments on aspects of the laboratory's performance other than deficiencies.

(2) The Specific Operations Checklist contains statements or questions that are specific to the test methods in the CPT program and focus on the testing requirements for the methods with emphasis on performing the tests, testing accuracy, instrumentation, calibration, personnel competency, and test reporting.

Individual Specific Operations Checklists for each CPT field have not been developed. Instead, one Specific Operations Checklist for all five fields is presented in Appendix C, along with comment sheets similar to those used with the General Operations Checklist. The Technical Assessor is required to supplement the Specific Operations Checklist in Appendix C with the specific requirements for the individual test methods being assessed.

Sec. 285.22 Assessing and evaluating a laboratory

(a) On-Site Assessment

(1) The NVLAP assessor will request the quality manual and/or documented procedures in advance of the on-site assessment to reduce time at the laboratory. Documents supplied in advance will be returned. The laboratory should be prepared to conduct demonstrations and tests and have testing equipment in good working order. The assessment will cover the requirements identified in this handbook, NIST Handbook 150, the laboratory's quality manual, and its written test procedures. During the time at the laboratory, the assessor will need time and work space to complete assessment documentation.

(2) NVLAP technical assessors are provided with "critical elements" in addition to the checklists described in 285.6, *NVLAP documentation,* to help assure the completeness, objectivity, and uniformity of the on-site assessment. The format of a critical element is presented in Appendix E.

(3) Along with the Specific Operations Checklist, the assessor uses the instructions and comment sheets shown in Appendix F in reviewing the laboratory's ability to perform the test methods. The test method review ranges from observing tests to having laboratory staff describe the test procedures. The assessor identifies on the test method review summary (p. F-4) whether the test method was reviewed by discussion or demonstration.

The test method review is directly connected to the critical elements. Note that the column headings of the Test Method Review Summary are essentially the same as the headings of the critical elements.

(4) An assessor performs the following activities during a typical on-site assessment:

(i) Conducts an entry briefing with the laboratory manager to explain the purpose of the on-site visit and to discuss the schedule for the day(s). At the discretion of the laboratory manager, other staff may attend the briefing.

(ii) Reviews laboratory quality manual and its implementation, and records, including the following:

- sample identification and tracking procedures and copies of completed test reports;

- records of periodic internal audits and use of quality control procedures and participation in interlaboratory comparisons or other similar programs; and

- personnel records, including résumés and job descriptions of key personnel and competency evaluations for all staff members who routinely perform the test method for which accreditation is sought.

At least one laboratory staff member must be available to answer questions; however, the assessor may wish to review the documents alone. The assessor usually does not ask to take any laboratory

documents with him and documents previously supplied will be returned.

(iii) Physically examines equipment and facilities and observes the demonstration of selected procedures by personnel assigned to conduct the tests, and interviews those personnel. The demonstrations may be selective or all-inclusive, but must include sample test material(s), preparation of devices, establishment of test conditions, and the setup and use of major equipment. The assessor may provide a proficiency test sample and request a specific demonstration.

(iv) Completes an On-Site Assessment Report, which contains the minimum requirements prescribed in NIST Handbook 150, Sec. 285.22(b)(2), as well as the completed checklists. At the exit briefing, a discussion of the assessment is carried out. The first page of the report is signed by the assessor and the laboratory's Authorized Representative to acknowledge the discussion but does not necessarily indicate agreement; appeals may be made through NVLAP. All observations made by the NVLAP assessor are held in the strictest confidence.

(b) Proficiency Testing

(1) NIST Handbook 150 defines (Sec. 285.5) and describes (Sec. 285.22(4)) how proficiency testing is included in the accreditation process.

Laboratories renewing or applying for accreditation in fields requiring proficiency testing must have satisfactorily participated in all required proficiency testing. Failure to participate is considered a deficiency and could result in suspension of accreditation.

(2) Laboratories seeking accreditation in the fields of Paper and Plastics are required to be enrolled and maintain participation in proficiency testing programs provided by the Collaborative Testing Services (CTS), 340 Herndon Parkway, Herndon, VA 22070; phone (703) 742-9107. The laboratories are required to participate in all test methods for which they are seeking accreditation and which CTS offers as part of its testing service. The laboratories apply and pay proficiency testing fees directly to CTS. CTS provides NVLAP with a summary report of the test results for each test method. It will be necessary that each laboratory authorize the release of the CTS identification code to NVLAP in order for NVLAP to review the individual proficiency testing data.

(3) At the current time, no proficiency testing is required for the fields of Paints, Plumbing, and Building Seals and Sealants. As appropriate, when proficiency testing is established for these fields, laboratories will be advised in advance of the effective date by which they must participate and the required fees or payments to NVLAP or the proficiency testing contractor.

(4) When NVLAP conducts proficiency testing or uses contractor services, the procedure is as follows.

(i) Once or twice a year each laboratory is sent, (or is instructed to obtain), selected test samples, data sheets, and instructions for test specimen handling, preparation, conditioning, mounting, and testing. Proficiency testing may consist of several parts in order that the operation of a laboratory might be evaluated. Also, portions of the standard test procedure may be emphasized; e.g., measurement and instrumentation, hardware, and data analysis. Generally, it is required that the specific proficiency test procedure be conducted in accordance with the applicable standard test method. At times NVLAP may specify special conditions to assure uniformity in procedures and test conditions among participants. Those may include the number of replicate measurements, special conditions of temperature and humidity, and other test parameters. ***The proficiency testing must not be contracted out to another laboratory.*** Completed test results and data sheets must be returned to NVLAP, or the designated address, by the date specified on the data sheets. Failure to return the data sheets by the deadline may result in penalties which may include suspension of accreditation.

(ii) On occasion, the on-site assessor hand carries proficiency test samples to the laboratory. These proficiency test

samples, like all others received by the laboratory, are to be listed or entered into the normal sample tracking and identification system for control and data recording. In these cases, at the direction of the assessor, the samples may be returned to the on-site assessor rather than stored at the laboratory. Alternatively, the laboratory may be instructed to send the samples back to the proficiency testing contractor, or to a destination specified by NVLAP or the proficiency testing contractor.

(iii) After completion of a given proficiency test round, samples that are not returned to the on-site assessor or proficiency testing contractor become the property of the laboratory for use at its discretion. Experience has shown that these proficiency test samples are often useful to the laboratory as training artifacts, or as calibration-check samples. ***However, in no case shall these proficiency test samples be considered as calibration standards or standard reference materials and be used as substitutes for calibration standards that are traceable to national (i.e., NIST) or international standards laboratories.***

(iv) Proficiency test data are analyzed using statistical procedures to determine distributions and parameters, such as averages, standard deviations, and outliers. The results of the proficiency testing are reported to the participants in appropriate documents and reports. The identity and performance of individual laboratories remain confidential. Test data from proficiency testing must be used in monitoring the laboratory's own test performance.

After notification of unsatisfactory performance, the laboratory must take corrective action to resolve the deficiency in a timely manner, similar to the process for on-site assessment deficiency resolution. Failures may result in revocation or suspension of accreditation.

The results of proficiency testing are also made available to on-site assessors for use during laboratory assessment visits. If problems are indicated by proficiency testing, they are discussed with appropriate laboratory personnel responsible for developing and implementing plans for resolving the problems.

Sec. 285.23 Granting and renewing accreditation

Laboratories granted NVLAP accreditation are provided with two documents: a Certificate of Accreditation and a Scope of Accreditation. Samples of these accreditation documents for the CPT program are shown in Appendix A. Note that the certificate states that the criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987).

Sec. 285.33 Criteria for accreditation

(c) **Quality system, audit and review**

(1) Under its quality system, the laboratory shall implement policies and operational procedures covering all of the technical requirements in this handbook. Periodic reviews of the quality system shall reflect adherence to NVLAP requirements and the laboratory's quality objectives. These reviews should reflect positive aspects of the quality system as well as deficiencies.

Examples of operational procedures that must be included in the quality manual are:

(i) procedures for receipt, identification, and tracking of test samples;

(ii) procedures by which the laboratory describes the CPT test samples and the criteria for their acceptance or rejection;

(iii) procedures for interlaboratory comparison and the laboratory's participation in proficiency testing, a summary of the results, and a description of any corrective actions taken because of the results; and

(iv) the personnel training and competency evaluations which demonstrate that the test procedures are being followed correctly.

(2) NIST Handbook 150, Sec. 285.33(c)(2) lists quality system requirements that must be

included in the quality manual. In addition, the quality manual must contain or make reference to the location of procedures or testing manuals containing detailed descriptions of the procedures, practices, and equipment that the laboratory uses in conducting the test methods for which it seeks accreditation.

(3) During the on-site assessment, supporting documentation is to be made readily accessible to the NVLAP assessor. The assessor reviews the laboratory's own detailed procedures to perform the CPT tests according to the standardized test procedures for which it seeks accreditation, the range of specimens it can test, and the descriptions of the maintenance and calibration of its specific equipment. Such descriptions may be prepared in a form convenient to the particular needs of the laboratory, but all the elements required by NVLAP procedures must be covered. The documentation must be readily accessible to the staff.

(4) The quality manual shall contain a description of the procedures that the laboratory uses to evaluate the uncertainty of its measurements using within-laboratory or replicate testing.

(5) The most recent publication of the standards for the test methods for which the laboratory is accredited shall be available as references and are to be followed in conducting the test procedures. The test methods that may be selected by the laboratory are listed in the Test Method Selection List (Appendix D).

(d) Personnel

(1) The laboratory shall maintain records on each staff member, including a résumé of qualifications; laboratory testing procedures to which the person is assigned; and the results of periodic testing performance reviews, which may include intra-operator tests and between-laboratory tests.

[NOTE: For the purpose of on-site assessments, a separate personnel folder of information specific to applicable NVLAP requirements may be provided instead of the complete folder which may contain confidential information not needed for the assessment.]

(2) The laboratory shall have a description of its training program for ensuring that staff are able to perform tests properly.

(3) The laboratory shall ensure that each new staff member is trained for the testing duties assigned and that staff members are retrained when they are assigned new responsibilities or when test methods are updated.

(4) The laboratory shall evaluate the competency of each staff member for each test method the staff member is authorized to conduct. An evaluation and observation of performance shall be conducted annually by the immediate supervisor, or a designee appointed by the laboratory director, and must be adequately documented. A record of the annual evaluation of each staff member must be dated and signed by the supervisor and the employee, and retained in the personnel file.

The following examples list competency review items:

(i) general requirements of the test methods;

(ii) specimen preparation, dimensional measurements, mounting techniques;

(iii) use and maintenance of environmental control apparatus, including humidity cabinets and cold boxes;

(iv) environmental conditioning of specimens;

(v) calibration requirements of test machines;

(vi) calibration-checks and reading of load/deformation/strain recording equipment;

(vii) determination of moisture content and specific gravity;

(viii) drying ovens and furnaces;

(ix) description of specimen and test set-up;

(x) operational requirements for balances and scales for mass determination;

(xi) use and operation of dimensional measuring devices (calipers, micrometers, etc.);

(xii) use and operation of automatic data logging and readout instrumentation; and

(xiii) use and operation of ammeters, ohmmeters, voltmeters, wattmeters, and potentiometers.

(5) Reference documents, texts, and current scientific and industry periodicals shall be made available to all technical staff to keep their knowledge up to date.

(f) Equipment and reference materials

(1) All facilities and equipment used for performing the applicable tests must conform with the requirements of the standard test methods. For departures from standard test methods and test equipment, the laboratory must provide sufficient data to show equivalency to that specified in the standard.

(2) The laboratory workspace and any environmentally controlled spaces (e.g., storage tanks, constant temperature-relative humidity rooms, or cabinets) are to be checked for proper environmental conditions. Environmental monitoring and controlling devices need to be checked for calibration status and proper functioning.

(3) The equipment used for conducting the tests in the CPT program shall be maintained and calibrated (or verified) in accordance with the manufacturer's recommendation, as specified in the test method, or as specified below, whichever results in shorter time periods between calibrations. It is the responsibility of the laboratories to ensure that **all** equipment is properly maintained and calibrated as required by the standards; the on-site assessor will check to ensure that the laboratories are in compliance for **all** equipment used. Due to the broad technical range of test methods covered by CPT, all equipment is not listed below.

Apparatus/ Instrumentation	*Calibration or Verification Frequency*
dimensional measuring devices (calipers, micrometers, etc.)	annually
drying ovens	annually
furnaces	annually
tensile/compression test machines and load cells	annually
scales and balances	annually
automatic data logging and readout*	annually
thermostats*	annually
potentiometers*	annually
ammeters, ohmmeters, voltmeters, and wattmeters*	annually
environmental conditioning units	quarterly
humidity cabinets	quarterly
cold boxes	quarterly

* If the calibration of the equipment is shown to vary due to the lack of modern solid-state electronics, then the entry under *Frequency* shall be 6 months.

(g) Measurement traceability and calibration

(1) The laboratory's calibrations may be performed by properly trained staff using calibrated standards, or through contract(s) with a competent external calibration service. All calibrations and characterizations must be done against reference standards that are traceable to national standards maintained by NIST or by a foreign national standards authority that issues reference or calibration materials. It is the responsibility of the laboratory seeking accreditation to determine that, where appropriate, calibration services use reference standards traceable to NIST or a foreign national standards authority. The use of a NVLAP-accredited calibration laboratory fulfills the foregoing traceability requirement.

(2) Calibration certificates and records and evidence of the traceability of the reference standards used must be retained and made available for an assessor's inspection during the on-site visit. The calibration certificate should indicate uncertainty or accuracy tolerance limits, and traceability of reference standards. If calibration is performed by the laboratory, the standard metrological procedures used, the environmental conditions, and the measurement uncertainty must be documented. Certificates are required for calibration performed by

outside services; they are not required for all testing equipment.

The records for each calibration and test shall contain sufficient information to permit their repetition. The records shall include the identity of personnel involved in sampling, preparation, calibration or testing.

(3) In addition to the information specified in NIST Handbook 150, Sec. 285.33(f)(4), testing equipment or verification records shall include the following:

(i) notation of all equipment variables requiring verification;

(ii) the range of verification;

(iii) the resolution of the instrument and its allowable error;

(iv) identity of the laboratory individual or external service responsible for calibration; and

(v) source of reference standard and traceability.

(h) Calibration and test methods

(1) Laboratories must use the test procedures described in the standards given in the Test Method Selection List (Appendix D). In order to maintain the quality of the test results, a laboratory must have written procedures for the laboratory personnel to follow when conducting the tests. These procedures should address any information not specifically contained in the standard method and any deviations used by the laboratory. These procedures should also include equipment operation, calibration checks, and quality control checks. The NVLAP assessor will evaluate the written procedures and determine their acceptability. The laboratory may use standard test methods in place of developing their own written procedures when the standard test method, at the discretion of the NVLAP assessor, provides sufficient detailed information to conduct the test.

(2) Departures from the standard test procedures are permissible only for conditions based upon technical equivalence and must be acceptable to the client. On-site assessors may only recommend acceptance of the departures to NVLAP; they are not authorized to grant approval to the laboratories.

Departures from those procedures must be identified in detail in test reports as either:

(i) due to client request or client submittal of a nonstandard sample (e.g., size too small), or

(ii) application of a selective mode of testing that deviates from the standard requirements for sound technically-based reasons (e.g., improvement of accuracy or precision).

If departures arise for laboratory-based reasons, as mentioned above, data must be available to show that these departures are equivalent to or improve the accuracy and/or precision of the measurement without compromising a given test.

(j) Records

(1) Records may be kept in hard copy or computer form (with an adequate back-up system) and shall be readily accessible and secure. Entries in laboratory notebooks shall be dated and signed or initialed. Computer-based records must contain entries of pertinent staff/date information for data as required in the quality manual. As an established safeguard, computer-based records must also contain the means to preserve integrity for maintenance of records, so that later modifications cannot be made. Records will be reviewed during the on-site assessment by selected sampling.

(2) The records to be maintained include:

(i) acceptance/rejection of CPT samples submitted for test;

(ii) comprehensive logs for tracking samples and test activities;

(iii) original data collected by the laboratory;

(iv) calibration and verification data;

(v) data and results of quality control;

(vi) equipment and maintenance records; and

(vii) test reports.

(3) Test records, sufficient to reconstruct test reports, shall be kept for a period of three years following the completion of testing, unless a longer period is required by the client, regulation, or the laboratory's own procedures.

(k) Certificates and reports

(1) All test reports must contain sufficient information for the exact test conditions to be reproduced at a later time if a retest is necessary. Reports intended for use only by the vendor may conform to vendor/laboratory contract obligations, but must be in accord with NVLAP requirements.

(2) In many cases, raw data collected by computer are collated, reduced, and analyzed for incorporation in the test report. The electronic transmission of the data and development of the test report is generally performed at the laboratory. However, at times, the report may be written at an adjunct facility that is located some distance from the testing laboratory. In such a case, the laboratory must have in place, procedures and documentation for assuring the quality and validity of the data transmission, and their incorporation in the test report.

If organizations use several departments for different testing functions, data collection, and data processing, it is necessary that lines of authority be defined and that no conflict exists. The assessor will review these procedures and documentation during the on-site assessment, and also assure that all NVLAP procedures regarding the writing and storage of reports are followed. Depending upon the assessor's evaluations of the procedures, descriptions and other documentation for assuring the validity of the data transmission and subsequent report writing, an assessment visit to the adjunct facility may be required. When warranted, the assessor will visit the adjunct facility at additional cost to the laboratory before accreditation is granted or renewed.

(m) Outside support services and supplies

The laboratory must verify or test incoming materials and supplies that affect the quality and accuracy of the test results. Examples include equipment vendors, general laboratory equipment, including chemicals and glassware, and data processing and acquisition equipment.

APPENDIX A

SAMPLE ACCREDITATION DOCUMENTS

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC GUIDE 25:1990
ISO/IEC GUIDE 58:1993
ISO 9002:1994

Certificate of Accreditation

DEPARTMENT OF COMMERCE * UNITED STATES OF AMERICA *

LABORATORY NAME
ANYTOWN, USA

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

COMMERCIAL PRODUCTS TESTING

January 1, 19--
Effective until

For the National Institute of Standards and Technology

NVLAP-01C (4-95)

NVLAP LAB CODE: 0000

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC GUIDE 25:1990
ISO/IEC GUIDE 58:1993
ISO 9002:1994

Scope of Accreditation

COMMERCIAL PRODUCTS TESTING **NVLAP LAB CODE 0000**

LABORATORY NAME
Anytown, USA 00000-0000
John Doe Phone: 000-000-0000

NVLAP Code	*Designation*	*Short Title*
PAINTS AND RELATED COATINGS AND MATERIALS		
09/A01	ASTM D56	Flash Point by Tag Closed Tester
09/B42	Fed. Std. 141, Method 4061	Drying Time
PAPER AND RELATED PRODUCTS		
09/E05	TAPPI T410-OM	Grammage of Paper and Paperboard (Weight per Unit Area)
09/E23	TAPPI T524-OM	Color of Paper and Paperboard (45°/0° Geometry)
PLUMBING - PLASTICS AND FIXTURES		
19/P01	ANSI Z124.1 (Sec. 4, 5, 6)	Plastic Bathtub Units (Structural Integrity, Physical Characteristics and Material Tests)
19/F01	ASME A112.18.1M (Sec. 5.2)	Plumbing Fixture Fittings (Coatings, Electrodeposited and Organic Tests)

January 1, 19--

Effective until

For the National Institute of Standards and Technology

NVLAP-01S (4-95)

APPENDIX B

GENERAL OPERATIONS CHECKLIST

GENERAL OPERATIONS CHECKLIST

Instructions to the Assessor: This checklist addresses general accreditation criteria prescribed in applicable sections of NIST Handbook 150, *NVLAP Procedures and General Requirements*.

This checklist follows and is numbered to correspond to the *NVLAP Procedures and General Requirements*, Subsection 285.33. The numbers in square brackets identify related checklist items. A small black triangle appears in the left-hand margin of selected lines of text throughout this checklist; the marked text applies only to the Calibration Laboratory Accreditation Program (LAP).

Place an "X" beside each checklist item which represents a deficiency. Place a "C" beside each item on which you are commenting for other reasons. Record the item number and your written deficiency explanations and/or comments in this list or on the attached comment sheets. Place a check beside all other items you observed or verified at the laboratory.

SEC. 285.33 CRITERIA FOR ACCREDITATION

(b) ***Organization and management***

(1) The laboratory shall be:

_____ (i) legally identifiable;

Legal name of laboratory ownership: _____

(ii) organized and shall operate in such a way that its permanent, temporary and mobile facilities meet the NVLAP requirements [see also (b)(2)(i), (c)(2)(ii)];

_____ (iii) properly identified on the NVLAP Application.

(2) The laboratory shall:

_____ (i) have managerial staff with the authority and resources needed to discharge their duties [see also (b)(1)(ii), (c)(2)(ii)];

_____ (ii) have policies to ensure that its personnel are free from any commercial, financial and other pressures which might adversely affect the quality of their work;

_____ (iii) be organized in such a way that confidence in its independence of judgment and integrity is maintained at all times;

_____ (iv) specify and document the responsibility, authority and interrelation of all personnel who manage, perform or verify work affecting the quality of calibrations and tests;

_____ (v) provide supervision by persons familiar with the calibration or test methods and procedures, the objective of the calibration or test, and the assessment of the results. The ratio of supervisory to non-supervisory personnel shall be such as to ensure adequate supervision;

_____ (vi) have a technical manager (however named) who has overall responsibility for the technical operations;

Name of person: _____

_____ (vii) have a quality manager (however named) who has responsibility for the quality system and its implementation. The quality manager shall have direct access to the highest level of management at which decisions are taken on laboratory policy or resources, and to the technical manager. In some laboratories, the quality manager may also be the technical manager or deputy technical manager;

Name of person: _____

_____ (viii) nominate deputy(ies) in case of absence of the technical or quality manager;

Name(s): _____

_____ (ix) have documented policy and procedures to ensure the protection of clients' confidential information and proprietary rights [see also (c)(2)(xviii)];

_____ (x) where appropriate, participate in interlaboratory comparisons and proficiency testing programs [see also (c)(2)(xiv), (c)(6)(ii), (g)(3)];

_____ (xi) have documented policy and procedures to ensure that its clients are served with impartiality and integrity.

(c) ***Quality system, audit and review***

(1) The laboratory shall:

_____ (i) have an established and maintained quality system appropriate to the type, range and volume of calibration and testing activities it undertakes;

_____ (ii) have the elements of the quality system documented;

_____ (iii) ensure that the quality documentation is available for use by the laboratory personnel;

_____ (iv) define and document its policies and objectives for, and its commitment to, good laboratory practice and quality of calibration or testing services;

_____ (v) have the laboratory management which ensures that these policies and objectives are documented in a quality manual and communicated to, understood, and implemented by all laboratory personnel concerned;

_____ (vi) ensure that the quality manual is maintained current under the responsibility of the quality manager [see also (c)(2)(iv)].

Date of quality manual: _____

Date of latest update: _____

(2) The quality manual, and related quality documentation, shall state the laboratory's policies and operational procedures established in order to meet the NVLAP requirements. The quality manual and related quality documentation shall contain:

_____ (i) a quality policy statement, including objectives and commitments, by top management;

_____ (ii) the organization and management structure of the laboratory, its place in any parent organization and relevant organizational charts;

_____ (iii) the relations between management, technical operations, support services and the quality system;

_____ (iv) procedures for control and maintenance of documentation [see also (c)(1)(vi), (j)(1)];

_____ (v) job descriptions of key staff and reference to the job descriptions of other staff;

_____ (vi) identification of the laboratory's approved signatories (list here or in the comments section): _____

_____

_____ (vii) the laboratory's procedures for achieving traceability of measurements;

_____ (viii) the laboratory's scope of calibrations and/or tests;

_____ (ix) written procedures for ensuring that the laboratory reviews all new work to ensure that it has the appropriate facilities and resources before commencing such work;

_____ (x) reference to the calibration, verification and/or test procedures used;

_____ (xi) procedures for handling calibration and test items;

_____ (xii) reference to the major equipment and reference measurement standards used;

_____ (xiii) reference to procedures for calibration, verification and maintenance of equipment;

_____ (xiv) reference to verification practices including interlaboratory comparisons, proficiency testing programs, use of reference materials and internal quality control schemes [see also (b)(2)(x), (c)(6)(ii), (g)(3)];

(xv) procedures to be followed for feedback and corrective action whenever:

_____ a) testing discrepancies are detected, or

_____ b) departures from documented policies and procedures occur;

_____ (xvi) the laboratory management policies for departures from documented policies and procedures or from standard specifications;

_____ (xvii) procedures for dealing with complaints [see also (n)];

_____ (xviii) procedures for protecting confidentiality and proprietary rights [see also (b)(2)(ix)];

_____ (xix) procedures for audit and review;

_____ (xx) a description of the laboratory's policy regarding the use of the NVLAP logo;

► _____ (xxi) a statement of the laboratory's policy for establishing and changing
► calibration intervals for equipment it controls; and

► _____ (xxii) a statement of the laboratory's policy concerning the technique(s) to be used
► for determining measurement uncertainty and calibration/verification
► adequacy.

_____ (3) The laboratory shall arrange for audits of its activities at appropriate intervals to verify that its operations continue to comply with the requirements of the quality system. Such audits shall be carried out by trained and qualified staff who are, wherever possible, independent of the activity to be audited. Where the audit findings cast doubt on the correctness or validity of the laboratory's calibration or test results, the laboratory shall take immediate corrective action and shall immediately notify, in writing, any client whose work may have been affected.

The audits shall be objective and be conducted internally or on contract. The audits shall include both general criteria (documents, records and policies) and technical compliance (test methods and practices and calibration procedures).

_____ (4) The quality system adopted to satisfy the NVLAP requirements shall be reviewed at least once a year by the management to ensure its continuing suitability and effectiveness and to introduce any necessary changes or improvements.

_____ (5) All audit and review findings and any corrective actions that arise from them shall be documented. The person responsible for quality shall ensure that these actions are discharged within the agreed timescale.

(6) In addition to periodic audits the laboratory shall ensure the quality of results provided to clients by implementing checks. These checks shall be reviewed and shall include, as appropriate, but not be limited to:

_____ (i) internal quality control plans, such as control charts and other available statistical techniques;

NOTE: Measurement assurance techniques are acceptable means to control the measurement process and consistently produce the highest quality measurements.

_____ (ii) participation in proficiency testing or other interlaboratory comparisons [see also (b)(2)(x), (c)(2)(xiv), (g)(3)];

_____ (iii) regular use of certified reference materials and/or in-house quality control using secondary reference materials;

_____ (iv) replicate testings using the same or different methods;

_____ (v) retesting of retained items;

_____ (vi) correlation of results for different characteristics of an item.

(d) ***Personnel*** [see also (c)(2)(v)]

_____ (1) The testing laboratory shall have sufficient personnel, having the necessary education, training, technical knowledge and experience for their assigned functions.

_____ (2) The testing laboratory shall ensure that the training of its personnel is kept up-to-date.

_____ (3) Records on the relevant qualifications, training, skills and experience of the technical personnel shall be maintained by the laboratory.

(e) ***Accommodation (facilities) and environment*** [see also (i)(3)]

_____ (1) Laboratory accommodation, calibration and test areas, energy sources, lighting, heating and ventilation shall be such as to facilitate proper performance of calibrations or tests.

NOTE: Laboratory design will be, to the maximum extent practical, in accordance with the guidelines found in the NCSL Recommended Practice #7, *Laboratory Design*, July 25, 1993.

_____ (2) The environment in which these activities are undertaken shall not invalidate the results or adversely affect the required accuracy of measurement. Particular care shall be taken when such activities are undertaken at sites other than the permanent laboratory premises.

NOTE: It is expected that environments which do not meet generally accepted norms, such as those found in NCSL Recommended Practice #7, yet which exhibit the stability required to apply necessary correction factors, will be specified by the laboratory for the purpose of assessment of compliance with its own procedures to achieve its stated uncertainties.

_____ (3) The laboratory shall provide facilities for the effective monitoring, control and recording of environmental conditions as appropriate. Due attention shall be paid, for example, to biological sterility, dust, electromagnetic interference, humidity, voltage, temperature, and sound and vibration levels, as appropriate to the calibrations or tests concerned.

_____ (4) There shall be effective separation between neighboring areas when the activities therein are incompatible.

_____ (5) Access to and use of all areas affecting the quality of these activities shall be defined and controlled.

_____ (6) Adequate measures shall be taken to ensure good housekeeping in the laboratory.

NOTE: While it is the laboratory's responsibility to comply with relevant health and safety requirements, this is outside the scope of this assessment.

(f) ***Equipment and reference materials***

(1) The laboratory shall:

_____ (i) be furnished with all items of equipment (including hardware, software, and reference materials) required for the correct performance of calibrations and tests;

_____ (ii) in those cases where the laboratory needs to use equipment outside its permanent control, including rented, leased and client-owned equipment, ensure that the relevant NVLAP requirements are met.

_____ (2) All equipment shall be properly maintained. Maintenance procedures shall be documented. Any item of the equipment which has been subjected to overloading or mishandling, or which gives suspect results, or has been shown by verification or otherwise to be defective, shall be taken out of service, clearly identified and wherever possible stored at a specified place until it has been repaired and shown by calibration, verification or test to perform satisfactorily. The laboratory shall examine the effect of this defect on previous calibrations or tests.

_____ (3) Each item of equipment including reference materials shall, when appropriate, be labelled, marked or otherwise identified to indicate its calibration status.

_____ (4) Records shall be maintained of each item of equipment and all reference materials significant to the calibrations or tests performed. The records shall include:

_____ (i) the name of the item of equipment, software or reference material;

_____ (ii) the manufacturer's name, type identification, and serial number or other unique identification;

_____ (iii) date received and date placed in service;

NOTE: For initial accreditation, the date received and the date placed in service are not considered mandatory requirements for inclusion in laboratory records, although this is encouraged as good laboratory practice.

_____ (iv) current location, where appropriate;

_____ (v) condition when received (e.g., new, used, reconditioned);

_____ (vi) copy of the manufacturer's instructions, where available;

_____ (vii) dates and results of calibrations and/or verifications and date of next calibration and/or verification;

_____ (viii) details of maintenance carried out to date and planned for the future;

_____ (ix) history of any damage, malfunction, modification or repair;

► _____ (x) measured value observed for each parameter found to be out of tolerance
► during calibration/verification.

(g) ***Measurement traceability and calibration***

_____ (1) All measuring and testing equipment having an effect on the accuracy or validity of calibrations or tests shall be calibrated and/or verified before being put into service. The laboratory shall have an established program for the calibration and verification of its measuring and test equipment. The program will ensure the recall or removal from service of any standard or equipment which has exceeded its calibration interval or is otherwise judged to be unreliable.

_____ (2) The overall program of calibration and/or verification and validation of equipment shall be designed and operated so as to ensure that, wherever applicable, measurements made by the laboratory are traceable to national standards of measurement where available. Calibration certificates shall, wherever applicable, indicate the traceability to national standards of measurement and shall provide the measurement results and associated uncertainty of measurement and/or a statement of compliance with an identified metrological specification.

NOTE: Traceability to national standards includes traceability to standards maintained or defined at national laboratories in foreign countries where applicable. In these cases, traceability is achieved via international standards. This includes intrinsic standards of measurement where available.

Where applicable, the methodology of the *Guide to the expression of uncertainty in measurement*: 1993, shall be used as the basis for expression of uncertainty of the measurement. NIST Technical Note 1297; January 1993, *Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results*, is a practical application document written around the *Guide to the expression of uncertainty in measurement*. Where detailed procedures are not used to quantify and combine uncertainties (i.e., use of test accuracy ratio concepts), the sources of uncertainty shall be tabulated and demonstrated to be acceptable for the measurement undertaken.

NOTE: A significant number of intrinsic standards, such as the Josephson Array Voltage Standard and the Iodine-Stabilized Helium-Neon Laser Length Standard, have been developed and are now being used by many national standards laboratories and some industrial laboratories. These standards are based on well-characterized laws of physics, fundamental constants of nature, or invariant properties of materials, and make ideal stable, precise, and accurate measurement standards if properly designed, characterized, operated, monitored and maintained. Where intrinsic standards are used, the laboratory should demonstrate by measurement assurance techniques, interlaboratory comparisons, or other suitable means, that its intrinsic standard measurement results are correlated with those of national or international standards.

_____ (3) Where traceability to national standards of measurement is not applicable, the laboratory shall provide satisfactory evidence of correlation of results, for example by participation in a suitable program of interlaboratory comparisons or proficiency testing [see also (b)(2)(x), (c)(2)(xiv), (c)(6)(ii)].

NOTE: Traceability requirements may also be satisfied by:

(i) internationally accepted standards in the field concerned;

(ii) suitable reference materials;

(iii) ratio or reciprocity measurements; or

(iv) mutual consent standards which are clearly specified and mutually agreed upon by all parties concerned.

_____ (4) Reference standards of measurement held by the laboratory shall be used for calibration only and for no other purpose, unless it can be demonstrated that their performance as reference standards has not been invalidated.

_____ (5) Reference standards of measurement shall be calibrated by a body that can provide traceability to a national standard of measurement. There shall be a program of calibration and verification for reference standards.

_____ (6) Where relevant, reference standards and measuring and testing equipment shall be subjected to in-service checks between calibrations and verifications.

_____ (7) Reference materials shall, where possible, be traceable to national or international standards of measurement, or to national or international standard reference materials.

(h) ***Calibration and test methods***

_____ (1) The laboratory shall have documented instructions on the use and operation of all relevant equipment, on the handling and preparation of items and for calibration and/or testing, where the absence of such instructions could jeopardize the calibrations or tests. All instructions, standards, manuals and reference data relevant to the work of the laboratory shall be maintained up-to-date and be readily available to the staff.

_____ (2) The laboratory shall use appropriate methods and procedures for all calibrations and tests and related activities within its responsibility (including sampling, handling, transport and storage, preparation of items, estimation of uncertainty of measurement and analysis of calibration and/or test data). They shall be consistent with the accuracy required, and with any standard specifications relevant to the calibrations or tests concerned.

NOTES:

(i) Calibration procedures shall contain the required range and tolerance or uncertainty of each item or unit parameter being calibrated or verified. In addition, the procedures shall contain the generic description of the measurement standards and equipment needed with the required parameter, range, tolerances or uncertainties, and specifications for performing the measurement of the calibration or verification, and/or representative types (manufacturer, model, option) that are capable of meeting the generic description for the measurement standards. The procedures shall be consistent with the accuracy required, and with any standard specifications relevant to the calibrations/verifications concerned.

(ii) The laboratory shall ensure that the calibration uncertainties are sufficiently small so that the adequacy of the measurement is not affected. Well-defined and documented measurement assurance techniques or uncertainty analyses may be used to verify the adequacy of a measurement process. If such techniques are not used, then the collective uncertainty of the measurement standards shall not exceed 25% of the acceptable tolerance (e.g., manufacturer's specification) for each characteristic of the measuring and test equipment being calibrated or verified.

_____ (3) Where methods are not specified, the laboratory shall, wherever possible, select methods that have been published in international or national standards, those published by reputable technical organizations or in relevant scientific texts or journals.

_____ (4) Where it is necessary to employ methods that have not been established as standard, these shall be subject to agreement with the client, be fully documented and validated, and be available to the client and other recipients of the relevant reports [see also (k)(2)(x)].

_____ (5) Where sampling is carried out as part of the test method, the laboratory shall use documented procedures and appropriate statistical techniques to select samples [see also (k)(2)(ix)].

_____ (6) Calculations and data transfers shall be subject to appropriate checks.

(7) Where computers or automated equipment are used for the capture, processing, manipulation, recording, reporting, storage or retrieval of calibration or test data, the laboratory shall have written procedures which ensure that:

_____ (i) the NVLAP requirements are complied with;

_____ (ii) computer software, computers or automated equipment is documented and adequate for use;

_____ (iii) procedures are established and implemented for protecting the integrity of data; such procedures shall include, but not be limited to, integrity of data entry or capture, data storage, data transmission and data processing;

_____ (iv) computer and automated equipment is maintained to ensure proper functioning and provided with the environmental and operating conditions necessary to maintain the integrity of calibration and test data [see also (f)(1)];

_____ (v) it establishes and implements appropriate procedures for the maintenance of security of data including the prevention of unauthorized access to, and the unauthorized amendment of, computer records.

_____ (8) Documented procedures shall exist for the purchase, reception and storage of consumable materials used for the technical operations of the laboratory [see also (m)(2)].

(i) ***Handling of calibration and test items***

_____ (1) The laboratory shall have a documented system for uniquely identifying the items to be calibrated or tested, to ensure that there can be no confusion regarding the identity of such items at any time [see also (k)(2)(v)].

_____ (2) Upon receipt, the condition of the calibration or test item, including any abnormalities or departures from standard condition as prescribed in the relevant calibration or test method, shall be recorded. Where there is any doubt as to the item's suitability for calibration or test, where the item does not conform to the description provided, or where the calibration or test required is not fully specified, the laboratory shall consult the client for further instruction before proceeding. The laboratory shall establish whether the item has received all necessary preparation, or whether the client requires preparation to be undertaken or arranged by the laboratory.

_____ (3) The laboratory shall have documented procedures and appropriate facilities to avoid deterioration or damage to the calibration or test item, during storage, handling, preparation, and calibration or test; any relevant instructions provided with the item shall be followed. Where items have to be stored or conditioned under specific environmental conditions, these conditions shall be maintained, monitored and recorded where necessary. Where a calibration or test item or portion of an item is to be held secure (for example, for reasons of record, safety or value, or to enable check calibrations or tests to be performed later), the laboratory shall have storage and security arrangements that protect the condition and integrity of the secured items or portions concerned [see also (e)].

_____ (4) The laboratory shall have documented procedures for the receipt, retention or safe disposal of calibration or test items, including all provisions necessary to protect the integrity of the laboratory.

_____ (5) Tamper-resistant seals shall be affixed to operator-accessible controls or adjustments on measurement standards or measuring and test equipment which, if moved, will invalidate the calibration. The laboratory's calibration system shall provide instructions for the use of such seals and for the disposition of equipment with damaged or broken seals.

NOTE: Tamper-resistant seals are sometimes affixed to equipment to prevent unauthorized access to areas where adjustments or critical components are located.

(j) ***Records***

_____ (1) The laboratory shall maintain a record system to suit its particular circumstances and comply with any applicable regulations. It shall retain on record all original observations, calculations and derived data, calibration records and a copy of the calibration certificate, test certificate or test report for an appropriate period. The records for each calibration and test shall contain sufficient information to permit their repetition. The records shall include the identity of personnel involved in sampling, preparation, calibration or testing [see also (c)(2)(iv)].

▸ **EXCEPTION:** The retention of all original observations, calculations, and
▸ derived data in the calibration record system is not a mandatory requirement
▸ for calibration laboratories, although it is encouraged as good laboratory
▸ practice.

_____ (2) All records (including those listed in (f)(4) pertaining to calibration and test equipment), certificates and reports shall be safely stored, held secure and in confidence to the client [see also (b)(2)(ix), (c)(2)(xviii)].

NOTE: The period of retention shall be specified in the quality manual.

Record retention time specified: _____

(k) *Certificates and reports*

_____ (1) The results of each calibration, test, or series of calibrations or tests carried out by the laboratory shall be reported accurately, clearly, unambiguously and objectively, in accordance with any instructions in the calibration or test methods. The results should normally be reported in a calibration certificate, test report or test certificate and should include all the information necessary for the interpretation of the calibration or test results and all information required by the method used [see also (k)(4)(i)].

NOTE: It is recognized that the results of each calibration do not always result in the production of a calibration certificate or report. Whenever a certificate or report is produced, the above requirements shall be met.

(2) Each certificate or report shall include at least the following information:

_____ (i) a title, e.g., "Calibration Certificate," "Test Report" or "Test Certificate";

_____ (ii) name and address of laboratory, and location where the calibration or test was carried out if different from the address of the laboratory;

_____ (iii) unique identification of the certificate or report (such as serial number) and of each page, and the total number of pages;

_____ (iv) name and address of client, where appropriate;

_____ (v) description and unambiguous identification of the item calibrated or tested [see also (i)(1)];

_____ (vi) characterization and condition of the calibration or test item;

_____ (vii) date of receipt of calibration or test item and date(s) of performance of calibration or test, where appropriate;

EXCEPTION: Although it is encouraged as good laboratory practice, the requirement for inclusion of the date received is not mandatory for calibration laboratories.

_____ (viii) identification of the calibration or test method used, or unambiguous description of any non-standard method used;

_____ (ix) reference to sampling procedure, where relevant [see also (h)(5)];

_____ (x) any deviations from, additions to or exclusions from the calibration or test method, and any other information relevant to a specific calibration or test, such as environmental conditions [see also (c)(2)(xv), (h)(4)];

_____ (xi) measurements, examinations and derived results, supported by tables, graphs, sketches and photographs as appropriate, and any failures identified;

_____ (xii) a statement of the estimated uncertainty of the calibration or test result, where relevant;

_____ (xiii) a signature and title, or an equivalent identification of the person(s) accepting responsibility for the content of the certificate or report (however produced), and date of issue [see also (c)(2)(vi)];

_____ (xiv) where relevant, a statement to the effect that the results relate only to the items calibrated or tested;

_____ (xv) a statement that the certificate or report shall not be reproduced except in full, without the written approval of the laboratory;

_____ (xvi) a statement that the report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government;

_____ (xvii) the signature of an approved signatory for all test and calibration reports endorsed with the NVLAP logo;

► _____ (xviii) special limitations of use; and

► _____ (xix) traceability statement.

_____ (3) Where the certificate or report contains results of calibrations or tests performed by subcontractors, these results shall be clearly identified [see also (l)].

_____ (4) Particular care and attention shall be paid to the arrangement of the certificate or report, especially with regard to presentation of the calibration or test data and ease of assimilation by the reader. The format shall be carefully and specifically designed for each type of calibration or test carried out, but the headings shall be standardized as far as possible [see also (k)(1)].

_____ (5) Material amendments to a calibration certificate, test report or test certificate after issue shall be made only in the form of a further document, or data transfer including the statement "Supplement to Calibration Certificate (or Test Report or Test Certificate), serial number ... (or as otherwise identified)," or equivalent form of wording. Such amendments shall meet all the relevant requirements of item (j).

_____ (6) The laboratory shall notify clients promptly, in writing, of any event such as the identification of defective measuring or test equipment that casts doubt on the validity of results given in any calibration certificate, test report, or test certificate or amendment to a report or certificate.

NOTE: Such notification shall quantify the magnitude of error created in the calibration results. The laboratory shall notify customers promptly, in writing, of any customer's measuring and test equipment found significantly out of tolerance during the calibration/verification process. Measurement data shall be reported so that appropriate action can be taken.

_____ (7) The laboratory shall ensure that, where clients require transmission of calibration or test results by telephone, telex, facsimile or other electronic or electromagnetic means, staff will follow documented procedures that ensure that the NVLAP requirements are met and that confidentiality is preserved.

_____ (8) Whenever a laboratory accredited by NVLAP issues a calibration or test report which contains data covered by the accreditation and also data not covered by the accreditation, it must clearly identify in its records, and in the report to the client, specifically which calibration or test method(s), or portion of a calibration or test method(s), was not covered by the accreditation. The laboratory must also inform the client, before the fact, when calibrations or tests requested are not covered by the accreditation.

NVLAP policy regarding calibration and test reports issued by an accredited laboratory, which reference the laboratory's accredited status, requires that any calibration or test report containing data from calibrations or tests which are not covered by the accreditation include:

_____ (i) a statement at the beginning of the report prominently indicating, "This report contains data which are not covered by the NVLAP accreditation"; and

_____ (ii) a clear indication of which data are not covered by the accreditation.

The laboratory must not misrepresent its accreditation. When a client requires or requests accredited services and any of the requested services are not covered by the accreditation, the client must be so advised.

(l) ***Subcontracting of calibration or testing*** [see also (k)(3)]

_____ (1) Where a laboratory subcontracts any part of the calibration or testing, this work shall be placed with a laboratory complying with these requirements. The laboratory shall ensure and be able to demonstrate that its subcontractor is competent to perform the activities in question and complies with the same criteria of competence as the laboratory in respect of the work being subcontracted. The laboratory shall advise the client in writing of its intention to subcontract any portion of the testing to another party.

_____ (2) The laboratory shall record and retain details of its investigation of the competence and compliance of its subcontractors and maintain a register of all subcontracting.

_____ (3) A NVLAP-accredited laboratory intending to subcontract testing or calibration work that will be performed and reported as meeting NVLAP procedures and criteria must:

_____ (i) have in its quality manual a subcontracting policy compatible with the NVLAP policy, with a description of the procedures for administering and implementing those actions to demonstrate the conformance and consistency of the subcontracted laboratory to perform according to NVLAP procedures;

_____ (ii) place the subcontracted work with a laboratory that maintains accreditation established by NVLAP shown by a current NVLAP Lab Code, or provide and maintain current records that demonstrate that the subcontracted laboratory is competent to perform the test(s) or calibration(s) and that it operates in a manner consistent with and in conformance to NVLAP criteria for accreditation;

_____ (iii) clearly identify in its records, and in the report to the client, exactly which data were obtained by the NVLAP-accredited laboratory and which data were obtained by the subcontractor, NVLAP-accredited or not;

_____ (iv) inform its client, before the fact, that it intends to subcontract for completion of all or a portion of the client's work; and

_____ (v) include at the beginning of the report the name, address, and contact person of the subcontracted laboratory(ies), and one of the following statements, as appropriate:

if NVLAP-accredited

"This report contains data which were produced by a subcontracted laboratory **ACCREDITED (NVLAP LAB CODE)** for the calibration or test methods performed"

if not NVLAP-accredited

"This report contains data which were produced by a subcontracted laboratory **NOT ACCREDITED** for the calibration or test methods performed."

The requirements of this section do not supersede any regulation, law, contract specification, or other related conditions which require NVLAP accreditation.

(m) ***Outside support services and supplies***

_____ (1) Where the laboratory procures outside services and supplies in support of calibrations or tests, the laboratory shall use only those outside support services and supplies that are of adequate quality to sustain confidence in the laboratory's calibrations or tests.

_____ (2) Where no independent assurance of the quality of outside support services or supplies is available, the laboratory shall have procedures to ensure that purchased equipment, materials and services comply with specified requirements. The laboratory should, wherever possible, ensure that purchased equipment and consumable materials are not used until they have been inspected, calibrated or otherwise verified as complying with any standard specifications relevant to the calibrations or tests concerned [see also (h)(8)].

_____ (3) The laboratory shall maintain records of all suppliers from whom it obtains support services or supplies required for calibrations or tests.

(n) ***Complaints*** [see also (c)(2)(xvii)]

_____ (1) The laboratory shall have documented policy and procedures for the resolution of complaints received from clients or other parties about the laboratory's activities. A record shall be maintained of all complaints and of the actions taken by the laboratory.

_____ (2) Where a complaint, or any other circumstance, raises doubt concerning the laboratory's compliance with the laboratory's policies or procedures, or with the NVLAP requirements or otherwise concerning the quality of the laboratory's calibrations or tests, the laboratory shall ensure that those areas of activity and responsibility involved are promptly audited in accordance with item (c)(3).

(o) ***Measuring and test equipment (M & TE)***

NOTE: This section applies to the control of measuring and test equipment (M & TE) used to assure that supplies and services comply with prescribed customer requirements. It is based in large part on the requirements found in government audit standards such as MIL-STD 45662A, and is found in Part II of the ANSI/NCSL Z540-1-1994 (Draft) standard.

(1) General requirements for M & TE

_____ (i) The supplier shall establish and document a system to control the calibration/verification of M & TE.

_____ (ii) M & TE used to determine compliance with customer technical specifications shall be calibrated or verified in accordance with sections 285.33(b) through (n).

_____ (iii) The supplier shall have a program to recall for calibration or verification, or remove from service, M & TE that has exceeded its calibration interval, has broken calibration seals, or is suspected to be malfunctioning because of mishandling, misuse, or unusual results.

_____ (iv) All operations performed by the supplier in compliance with these requirements shall be subject to customer verification at unscheduled intervals.

_____ (v) The supplier shall carry out, or arrange to have carried out, periodic quality auditing of the calibration and verification system in order to ensure its continuing effective implementation and compliance with these requirements.

- Based on the results of the audits and any other relevant factors, such as customer feedback, the supplier shall review and modify the system as necessary.

- Plans and procedures for the audits shall be documented. The conduct of the audit and any subsequent corrective action shall also be documented.

(2) Detailed requirements for M & TE

_____ (i) Calibration system description: The supplier shall provide and maintain a written description of the calibration/verification system covering M & TE and measurement standards. The description shall be sufficient to satisfy each requirement of section 285.33(o) and any deviations shall be submitted with supporting documentation to the customer for approval.

_____ (ii) Adequacy of measurement standards: Measurement standards used by the supplier for calibrating M & TE and other measurement standards shall comply with the requirements of items (f)(1), (g)(1), and (h)(2).

_____ (iii) Environmental conditions: M & TE shall be used in an environment controlled to the extent necessary to ensure valid results. Due consideration shall be given to temperature, humidity, lighting, vibration, dust control, cleanliness, electromagnetic interference and any other factors affecting the results of measurements. Where pertinent, these factors shall be monitored and recorded and, when appropriate, correcting compensations shall be applied to measurement results.

_____ (iv) Intervals of calibration and verification: M & TE requiring calibration shall be calibrated or verified at periodic intervals established and maintained to assure acceptable reliability, where reliability is defined as the probability that M & TE will remain in-tolerance throughout the interval. Intervals shall be established for all M & TE requiring calibration unless the equipment is regularly monitored through the use of check standards in a documented measurement assurance process. Check standards must closely represent the item parameters normally tested in the process and the check standard must be verified periodically. Where intervals are used to ensure reliability, the interval setting system must be systematically applied and shall have stated reliability goals and a method of verifying that the goals are being attained. Intervals may be based on usage or time since last calibration or verification. All exemptions from periodic calibration or verification shall be documented. The recall system may provide for the temporary extension of the calibration due date for limited periods of time under specified conditions that do not unreasonably impair the satisfaction of the customer's requirements.

_____ (v) Calibration procedures: Procedures used to calibrate/verify the supplier's M & TE shall comply with the requirements of items (h)(1) and (h)(2).

_____ (vi) Out-of-tolerance conditions: If any M & TE is found to be significantly out of tolerance during the calibration/verification process, the supplier's system shall provide for notification to the user and to the supplier's quality element, if appropriate, of the out-of-tolerance condition with the associated measurement data so that appropriate action can be taken.

_____ (vii) Adequacy of calibration system: The supplier shall establish and maintain documented procedures to evaluate the adequacy of the calibration system and to ensure compliance with these requirements.

_____ (viii) Calibration sources: M & TE requiring calibration shall be calibrated or verified by laboratories that comply with sections 285.33(b) through (n).

_____ (ix) Records: These requirements shall be supported by records documenting that established schedules and procedures are followed to maintain the adequacy of all M & TE. The records for M & TE requiring calibration shall include an individual record of calibration or verification, or other means of control, providing a description or identification of the item, calibration interval, date calibrated, identification of the calibration source, calibration results (data and/or condition status) and calibration action taken (adjusted, repaired, new value assigned, derated, etc.).

_____ (x) Calibration status: M & TE shall be labeled to indicate calibration or verification status. The label shall identify specific date calibrated (day, month, year, Julian date, or equivalent) and the specific calibration due date or usage equivalent. Items not calibrated to their full capability or which have other limitations of use, shall be labeled or otherwise identified as to the limitations. When it is impractical to apply a label directly to an item, the label may be affixed to the instrument container or some other suitable means may be used to reflect calibration status. Tamper-resistant seals are affixed to operator accessible controls or adjustments which if moved will invalidate the calibration. The quality system shall provide instructions for the disposition of equipment with broken tamper-resistant seals.

_____ (xi) Control of subcontractor calibration: The supplier is responsible for assuring that the subcontractor's calibration system conforms to section 285.33 (l) to the degree necessary to assure compliance with contractual requirements. NVLAP accreditation of the subcontractor's laboratory can serve as the basis for compliance with this requirement.

_____ (xii) Storage and handling: M & TE shall be handled, stored, and transported in a manner which shall not adversely affect the calibration or condition of the equipment.

NVLAP LAB CODE: _____

GENERAL OPERATIONS CHECKLIST - COMMENTS AND DEFICIENCIES

Instructions to the Assessor: Use this sheet to document comments and deficiencies. For each, identify the appropriate item number from the checklist. Identify comments with a "C" and deficiencies with an "X." If additional space is needed, make copies of this page (or use additional blank sheets).

Item No.	*Comments and/or Deficiencies*

NVLAP LAB CODE:

GENERAL OPERATIONS CHECKLIST - COMMENTS AND DEFICIENCIES

Instructions to the Assessor: Use this sheet to document comments and deficiencies. For each, identify the appropriate item number from the checklist. Identify comments with a "C" and deficiencies with an "X." If additional space is needed, make copies of this page (or use additional blank sheets).

Item No.	*Comments and/or Deficiencies*

APPENDIX C

SPECIFIC OPERATIONS CHECKLIST

NVLAP LAB CODE: _____

SPECIFIC OPERATIONS CHECKLIST

COMMERCIAL PRODUCTS TESTING

Instructions to the Assessor: The checklist addresses specific accreditation criteria prescribed in Section 285.33, *Criteria for Accreditation*, of the Commercial Products Testing (CPT) Program Handbook. Included also are instructions and comments sheets used for observing actual demonstrations of the performance of selected test methods. These criteria **do not** supersede the *Criteria for Accreditation*, based on Section 285.33 of the *NVLAP Procedures and General Requirements* prescribed in (NIST Handbook 150), which are addressed in the GENERAL OPERATIONS CHECKLIST.

Place an "X" beside any of the following items which represent a deficiency. Place a "C" beside each item on which you are commenting for other reasons. Record the item number and your deficiency explanation and/or comments on the appropriate comment sheet(s). Place a check beside all other items you observed or verified at the laboratory.

1 QUALITY SYSTEM

_____ 1.1 The quality manual or operating procedures provides detailed instructions, including descriptions of equipment, that the laboratory follows in conducting test methods for which it seeks accreditation in the areas of paints, paper, plastics, plumbing, and seals/sealants.

_____ 1.2 The quality manual lists the range (e.g., product type, size, shape, density, and property level) of test specimens that a laboratory can test for each test method for which accreditation is sought.

_____ 1.3 The quality manual describes practices for maintenance and calibration, including calibration interval, of the equipment used in conducting the tests in the CPT Program.

2 PERSONNEL

Personnel competency for CPT testing includes applicable portions of the following, as a minimum:

_____ 2.1 general requirements of the test methods;

_____ 2.2 specimen preparation, dimensional measurements, mounting techniques;

_____ 2.3 operation of environmental control apparatus, including humidity cabinets and cold boxes;

_____ 2.4 procedures for environmental conditioning of specimens;

_____ 2.5 calibration requirements of test machines;

_____ 2.6 determination of moisture content and specific gravity;

_____ 2.7 calibration requirements and operation of load/deformation/strain-recording equipment;

_____ 2.8 operation of drying ovens and furnaces;

_____ 2.9 description of specimen and test setup;

_____ 2.10 use of balances and scales for mass determination;

_____ 2.11 use of dimensional measuring devices (calipers, micrometers, etc.);

_____ 2.12 use of automatic data logging and readout instrumentation; and

_____ 2.13 operation of ammeters, ohmmeters, voltmeters, wattmeters, and potentiometers.

3 CALIBRATION AND TEST METHODS

3.1 Laboratory Operations and Test Standards

_____ 3.1.1 Samples and test specimens are uniquely identified for correlation with related records.

_____ 3.1.2 Test data forms (as required by the reference standard or developed in-house) are properly completed.

_____ 3.1.3 The laboratory maintains a dated log book or record for the tests it performs.

_____ 3.1.4 Measurement equipment is appropriate for the test method.

_____ 3.1.5 The latest version of the test standards for which the laboratory seeks accreditation is available.

3.2 Calibration Requirements

_____ Test equipment, devices, and instruments meet the requirements of the appropriate standards and are properly calibrated (and meet calibration conditions).

Specific calibration requirements for the CPT program are:

- in accordance with the manufacturer's recommendation;
- the test method; or
- as specified in the following table;

whichever results in shorter time periods between calibrations.

It is the responsibility of the laboratories to ensure that **all** equipment is properly maintained and calibrated as required by the standards; the on-site assessor will check to ensure that the laboratories are in compliance for **all** equipment used. Due to the broad technical range of test methods covered by CPT, all equipment is not listed below.

Apparatus/Instrumentation	*Calibration or Verification Frequency*
dimensional measuring devices (calipers, micrometers, etc.)	annually
drying ovens	annually
furnaces	annually
tensile/compression test machines and load cells	annually
scales and balances	annually
automatic data logging and readout*	annually
thermostats*	annually
potentiometers*	annually
ammeters, ohmmeters, voltmeters and wattmeters*	annually
environmental conditioning units	quarterly
humidity cabinets	quarterly
cold boxes	quarterly

* If the calibration of the equipment is shown to vary due to the lack of modern solid-state electronics, then the entry under *Frequency* shall be 6 months.

3.3 Mechanical, Physical, and Chemical Properties

_____ 3.3.1 Samples are properly prepared, environmentally conditioned (including proper moisture content), handled, and maintained before testing.

_____ 3.3.2 Measurements of specimen dimensions and mass are determined correctly; descriptions of important sample characteristics are recorded when required.

_____ 3.3.3 Test(s) are conducted within the specified environmental conditions, including temperature and relative humidity.

_____ 3.3.4 Specimens and products are tested in the specified orientation, if any, and with proper test setup.

_____ 3.3.5 For mechanical testing, the proper rate of load, strain, or deformation is applied to specimen.

NVLAP LAB CODE: ____

CPT SPECIFIC OPERATIONS CHECKLIST - COMMENTS AND DEFICIENCIES

Instructions to the Assessor: Use this sheet to document comments and deficiencies. For each, identify the appropriate item number from the checklist. Identify comments with a "C" and deficiencies with an "X." If additional space is needed, make copies of this page (or use additional blank sheets).

Item No.	*Comments and/or Deficiencies*

APPENDIX D

TEST METHOD SELECTION LIST

NVLAP LAB CODE: ____

COMMERCIAL PRODUCTS TESTING
TEST METHOD SELECTION LIST

Check those test methods for which you are requesting accreditation and total the test methods at the bottom of each page. The latest version of the test methods must be used (see NVLAP Procedures Sec. 285.32(a)(5)).

NVLAP Test Method Code	*Test Method Designation*	*Short Title*

PAINTS AND RELATED COATINGS AND MATERIALS

NOTE: For Paints and Related Coatings and Materials, visual reference materials for certain standards must be available in the laboratory. Contact ASTM at (215) 299-5507 and the Federation of Societies for Coatings Technology (FSCT) at (610) 940-0777 for further information.

___	09/A01	ASTM D56	Flash Point by Tag Closed Tester
___	09/A02	ASTM D93	Flash Point by Pensky-Martens Closed Tester
___	09/A03	ASTM D153	Specific Gravity of Pigments
___	09/A04	ASTM D185	Coarse Particles in Pigments, Pastes and Paints
___	09/A05	ASTM D281	Oil Absorption of Pigments by Spatula Rub-Out
___	09/A06	ASTM D387	Color and Strength of Color Pigments With a Mechanical Muller
___	09/A07	ASTM D523	Specular Gloss
___	09/A08	ASTM D562	Consistency of Paints Using the Stormer Viscometer
___	09/A09	ASTM D1005	Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers
___	09/A10	ASTM D1186	Nondestructive Measurement of Dry-Film Thickness of Nonmagnetic Coatings Applied to a Ferrous Base
___	09/A11	ASTM D1200	Viscosity of Paints, Varnishes, and Lacquers by Ford Viscosity Cup
___	09/A12	ASTM D1210	Fineness of Dispersion of Pigment-Vehicle Systems

___	09/A13	ASTM D1212	Wet Film Thickness of Organic Coatings
___	09/A14	ASTM D1296	Odor of Volatile Solvents and Diluents
___	09/A15	ASTM D1310	Flash Point and Fire Points of Liquids by Tag Open-Cup Apparatus
___	09/A16	ASTM D1400	Nondestructive Measurement of Dry-Film Thickness of Nonconductive Coatings Applied to a Nonferrous Metal Base
___	09/A17	ASTM D1475	Density of Paint, Varnish, Lacquer, and Related Products
___	09/A18	ASTM D1544	Color of Transparent Liquids (Gardner Color Scale)
___	09/A19	ASTM D1729	Visual Evaluation of Color Differences of Opaque Materials
___	09/A20	ASTM D2244	Calculation of Color Differences from Instrumentally Measured Color Coordinates
___	09/A21	ASTM D3278	Flash Point of Liquids by Setaflash-Closed-Cup Apparatus
___	09/A22	ASTM D3363	Film Hardness by Pencil Test
___	09/A23	ASTM D3793	Low-Temperature Coalescence of Latex Paint Films
___	09/A24	ASTM D4061	Retroreflectance of Horizontal Coatings
___	09/A25	ASTM D4212	Viscosity by Dip-Type Viscosity Cups
___	09/A26	ASTM E1347	Color and Color-Difference Measurement by Tristimulus (Filter) Colorimetry
___	09/A27	ASTM E308	Computing the Colors of Objects by Using the CIE System
___	09/A28	ASTM E313	Indexes of Whiteness and Yellowness of Near-White Opaque Materials
___	09/A29	ASTM E430	Gloss of High Gloss Surfaces by Goniophotometry
___	09/B01	ASTM D279	Bleeding of Pigments
___	09/B02	ASTM D332	Relative Tinting Strength of White Pigments by Visual Observation

___	09/B03	ASTM D344	Relative Dry Hiding Power of Paints by Visual Evaluation of Brushouts
___	09/B04	ASTM D610	Rusting on Painted Steel Surfaces
___	09/B05	ASTM D4214	Chalking of Exterior Paint Films
___	09/B06	ASTM D660	Checking of Exterior Paints
___	09/B07	ASTM D661	Cracking of Exterior Paints
___	09/B08	ASTM D662	Erosion of Exterior Paints
___	09/B09	ASTM D711	No-Pick-Up Time of Traffic Paint
___	09/B10	ASTM D714	Blistering of Paints
___	09/B11	ASTM D772	Flaking (Scaling) of Exterior Paints
___	09/B12	ASTM D868	Bleeding of Traffic Paint
___	09/B13	ASTM D968	Abrasion Resistance of Organic Coatings by Falling Abrasive
___	09/B14	ASTM D869	Settling of Paint
___	09/B15	ASTM D870	Water Resistance of Coatings Using Water Immersion
___	09/B16	ASTM D913	Chipping of Traffic Paint
___	09/B18	ASTM D969	Bleeding of Traffic Paint
___	09/B19	ASTM D1308	Effect of Household Chemicals on Clear and Pigmented Organic Finishes
___	09/B20	ASTM D1309	Settling Properties of Traffic Paint During Storage
___	09/B21	ASTM D1360	Fire Retardancy of Paints (Cabinet Method)
___	09/B23	ASTM D1640	Drying, Curing, or Film Formation of Organic Coatings at Room Temperature
___	09/B24	ASTM D522	Mandrel Bend Test of Attached Organic Coatings
___	09/B25	ASTM D2197	Adhesion of Organic Coatings by Scrape Adhesion
___	09/B26	ASTM D2243	Freeze-Thaw Resistance of Water-Borne Coatings

___	09/B27	ASTM D2248	Detergent Resistance of Organic Finishes
___	09/B29	ASTM D2486	Scrub Resistance of Interior Latex Flat Wall Paints
___	09/B31	ASTM D2805	Hiding Power of Paints by Reflectometry
___	09/B32	ASTM D3273	Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
___	09/B33	ASTM D3274	Surface Disfigurement of Paint Films by Microbial (Fungal or Algal) Growth or Soil and Dirt Accumulation
___	09/B34	ASTM D3450	Washability Properties of Interior Architectural Coatings
___	09/B35	ASTM D3456	Susceptibility of Paint Films to Microbiological Attack
___	09/B36	ASTM D3623	Antifouling Panels in Shallow Submergence
___	09/B37	ASTM D4060	Abrasion Resistance of Organic Coatings by the Taber Abraser
___	09/B38	ASTM D4062	Leveling of Paints by Draw-Down Method
___	09/B39	ASTM D4213	Wet Abrasion Resistance of Interior Paints
___	09/B41	Fed. Std. 141, Method 4494	Sag Test (Multinotch Blade)
___	09/B42	Fed. Std. 141, Method 4061	Drying Time
___	09/B43	ASTM D3359	Measuring Adhesion by Tape Test
___	09/B44	ASTM D4828	Practical Washability of Organic Coatings
___	09/C01	ASTM D34	Chemical Analysis of White Pigments
___	09/C02	ASTM D95	Water in Petroleum Products and Bituminous Materials by Distillation
___	09/C03	ASTM D521	Chemical Analysis of Zinc Dust (Metallic Zinc Powder)
___	09/C04	ASTM D563	Phthalic Anhydride Content of Alkyd Resins and Resin Solutions
___	09/C05	ASTM D611	Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents

___	09/C06	ASTM D1078	Distillation Range of Volatile Organic Liquids
___	09/C07	ASTM D1133	Kauri-Butanol Value of Hydrocarbon Solvents
___	09/C08	ASTM D1208	Common Properties of Certain Pigments
___	09/C09	ASTM D1259	Nonvolatile Content of Resin Solutions
___	09/C10	ASTM D1306	Phthalic Anhydride Content of Alkyd Resins and Esters Containing Other Dibasic Acids (Gravimetric)
___	09/C11	ASTM D1353	Nonvolatile Matter in Volatile Solvents for Use in Paint, Varnish, Lacquer and Related Products
___	09/C12	ASTM D1364	Water in Volatile Solvents (Fischer Reagent Titration Method)
___	09/C13	ASTM D1394	Chemical Analysis of White Titanium Pigments
___	09/C14	ASTM D1397	Unsaponifiable Matter in Alkyd Resins and Resin Solutions
___	09/C15	ASTM D1398	Fatty Acid Content of Alkyd Resins and Alkyd Resin Solutions
___	09/C16	ASTM D1399	Unsaponifiable Contents of Tricresyl Phosphate
___	09/C17	ASTM D1467	Fatty Acids Used in Protective Coatings
___	09/C18	ASTM D1469	Total Rosin Acids Content of Coating Vehicles
___	09/C19	ASTM D1541	Total Iodine Value of Drying Oils and Their Derivatives
___	09/C20	ASTM D1613	Acidity in Volatile Solvents and Chemical Intermediates Used in Paint, Varnish, Lacquer and Related Products
___	09/C21	ASTM D1639	Acid Value of Organic Coating Materials
___	09/C22	ASTM D1644	Nonvolatile Content of Varnishes
___	09/C23	ASTM D1652	Epoxy Content of Epoxy Resins
___	09/C24	ASTM D2075	Iodine Value of Fatty Amines, Amidoamines, and Diamines

___	09/C25	ASTM D2076	Acid Value and Amine Value of Fatty Quaternary Ammonium Chlorides
___	09/C26	ASTM D2369	Volatile Content of Coatings
___	09/C27	ASTM D2371	Pigment Content of Solvent-Reducible Paints
___	09/C28	ASTM D2697	Volume Nonvolatile Matter in Clear or Pigmented Coatings
___	09/C29	ASTM D2698	Pigment Content of Solvent-Reducible Paints by High-Speed Centrifuging
___	09/C30	ASTM D2832	Volatile and Nonvolatile Content of Paint and Related Coatings
___	09/C31	ASTM D3009	Composition of Turpentine by Gas Chromatography
___	09/C32	ASTM D3271	Direct Injection of Solvent-Reducible Paints into Gas Chromatograph for Solvent Analysis
___	09/C33	ASTM D3272	Vacuum Distillation of Solvents from Solvent-Reducible Paints for Analysis
___	09/C34	ASTM D3335	Low Concentrations of Lead, Cadmium, and Cobalt in Paint by Atomic Absorption Spectroscopy
___	09/C35	ASTM D3624	Low Concentrations of Mercury in Paint by Atomic Absorption Spectroscopy
___	09/C36	ASTM D3718	Low Concentrations of Chromium in Paint by Atomic Absorption Spectroscopy
___	09/C37	ASTM D3723	Pigment Content of Water-Emulsion Paints by Low-Temperature Ashing
___	09/C38	ASTM D3792	Water Content of Water-Reducible Paints by Direct Injection into a Gas Chromatograph
___	09/C39	ASTM D3960	Volatile Organic Compound (VOC) Content of Paints and Related Coatings
___	09/C40	ASTM D4017	Water in Paints and Paint Materials by Karl Fischer Method

___	09/C41	ASTM D4457	Determination of Dichloromethane and 1,1,1-Trichloroethane in Paints and Coatings by Direct Injection into a Gas Chromatograph
___	09/D01	ASTM B117	Operating Salt Spray (Fog) Testing Apparatus
___	09/D02	ASTM D609	Preparation of Cold-Rolled Steel Panels for Testing Paint, Varnish, Conversion Coatings, and Related Coating Products
___	09/D03	ASTM D822	Tests on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon-Arc Light and Water-Exposure Apparatus
___	09/D04	ASTM D823	Producing Films of Uniform Thickness of Paint, Varnish, and Related Products on Test Panels
___	09/D05	ASTM D1006	Exterior Exposure Tests of Paints on Wood
___	09/D06	ASTM D1014	Exterior Exposure Tests of Paints on Steel
___	09/D07	ASTM D1654	Painted or Coated Specimens Subjected to Corrosive Environments
___	09/D08	ASTM D1730	Preparation of Aluminum and Aluminum-Alloy Surfaces for Painting
___	09/D09	ASTM D1734	Making Cementitious Panels for Testing Paint Finishes
___	09/D10	ASTM D2247	Water Resistance of Coatings in 100% Relative Humidity
___	09/D11	ASTM D2372	Separation of Vehicle Solvent-Reducible Paints
___	09/D12	ASTM D3361	Operating Light-and Water-Exposure Apparatus (Unfiltered Open-Flame Carbon-Arc Type) for Testing Paint, Varnish, Lacquer, and Related Products Using the Dew Cycle
___	09/D13	ASTM D3924	Standard Environment for Conditioning and Testing Paint, Varnish, Lacquer, and Related Materials
___	09/D14	ASTM G23	Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials

___	09/D15	ASTM G26	Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials
___	09/D16	ASTM G53	Operating Light-and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials

PAPER AND RELATED PRODUCTS

Paper and Paperboard

NOTE: To obtain accreditation for test methods requiring testing in a standard test atmosphere, a laboratory must also request accreditation for 09/E02.

___	01/F01	TAPPI T461-OM	Flame Resistance of Treated Paper and Paperboard
___	01/V02	TAPPI T419-OM	Starch in Paper
___	01/V03	TAPPI T487-CM	Fungus Resistance of Paper and Paperboard
___	01/V04	ASTM E96	Water Vapor Transmission of Materials
___	09/E01	TAPPI T208-OM	Moisture in Wood, Pulp, Paper and Paperboard by Toluene Distillation
___	09/E02	TAPPI T402-OM; ASTM D685	Standard Conditioning and Testing Atmospheres for Paper, Board, Pulp Handsheets and Related Products
___	09/E03	TAPPI T403-OM; ASTM D774	Bursting Strength of Paper
___	09/E04	TAPPI T404-CM	Tensile Breaking Strength and Elongation of Paper and Paperboard (Using Pendulum-Type Tester)
___	09/E05	TAPPI T410-OM	Grammage of Paper and Paperboard (Weight per Unit Area)
___	09/E06	TAPPI T411-OM	Thickness (Caliper) of Paper, Paperboard, and Combined Board
___	09/E07	TAPPI T412-OM; ASTM D644	Moisture in Pulp, Paper and Paperboard
___	09/E08	TAPPI T414-OM	Internal Tearing Resistance of Paper (Elmendorf-Type Method)
___	09/E09	TAPPI T425-OM	Opacity of Paper (15°/Diffuse Illuminant A, 89% Reflectance Backing and Paper Backing)
___	09/E10	TAPPI T435-OM	Hydrogen Ion Concentration (pH) of Paper Extracts (Hot Extraction Method)
___	09/E11	TAPPI T452-OM	Brightness of Pulp, Paper and Paperboard (Directional Reflectance at 457 nm)
___	09/E12	TAPPI T459-OM; ASTM D2482	Surface Strength of Paper (Wax Pick Test)

___	09/E13	TAPPI T460-OM; ASTM D726	Air Resistance of Paper
___	09/E14	TAPPI T470-OM	Edge Tearing Resistance of Paper (Finch Method)
___	09/E15	TAPPI T480-OM	Specular Gloss of Paper and Paperboard at 75 Degrees
___	09/E16	TAPPI T489-OM	Stiffness of Paper and Paperboard (Taber-Type Stiffness Tester)
___	09/E17	TAPPI T494-OM	Tensile Breaking Properties of Paper and Paperboard (Using Constant Rate of Elongation Apparatus)
___	09/E18	TAPPI T511-OM; ASTM D2176	Folding Endurance of Paper (MIT Tester)
___	09/E19	TAPPI T538-OM	Sheffield Smoothness of Paper and Paperboard (Air Flow Method)
___	09/E20	TAPPI T809-OM	Flat Crush Corrugating Medium (CMT Test)
___	09/E21	TAPPI T818-OM	Ring Crush of Paperboard
___	09/E22	TAPPI T807-OM	Bursting Strength of Paper and Linerboard
___	09/E23	TAPPI T524-OM	Color of Paper and Paperboard (45°/0° Geometry)
___	09/E24	TAPPI T527-OM	Color of Paper and Paperboard (d/0° Geometry)
___	09/E25	TAPPI T826-PM	Short-Span Compressive Strength of Paperboard
___	09/E26	TAPPI UM-524	Porosity of Paper by Resistance to Airflow
___	09/E27	TAPPI UM-403	Test for Interfiber Bond Using the Internal Bond Tester
___	09/E28	TAPPI T541-OM	Internal Bond Strength of Paperboard (Z-Direction Tensile)
___	09/E29	TAPPI T476-OM	Abrasion Loss of Paper and Paperboard (Taber-Type Method)

Permanent Record Papers

___	09/F01	TAPPI UM-548; ASTM D3208/Par. 11.1; ASTM D3290/Par. 11.2	Flourescent Component of Brightness

Pressure Sensitive Tapes

___	09/G01	ASTM D3330, D3330M	Peel Adhesion of Pressure-Sensitive Tape at 180-Degree Angle
___	09/G02	ASTM D3652	Thickness of Pressure-Sensitive and Gummed Tapes
___	09/G03	ASTM D3654, D3654M	Holding Power of Pressure-Sensitive Tapes
___	09/G04	ASTM D3662	Test for Bursting Strength of Pressure-Sensitive Tapes
___	09/G05	ASTM D3759	Tensile Strength and Elongation of Pressure-Sensitive Tapes
___	09/G06	ASTM D3811	Unwind Force of Pressure-Sensitive Tapes
___	09/G07	ASTM D3815	Accelerated Aging of Pressure-Sensitive Tapes by Carbon-Arc Exposure Apparatus

Packaging and Packaging Materials (including Corrugated Board)

NOTES:

(1) To obtain accreditation for test methods requiring testing in a standard test atmosphere, a laboratory must also request accreditation for 09/E02.

(2) Methods 5005.1-5026 are part of "Federal Test Method Standard 101C for Packing, Packaging, Preservation and Transportability."

___	09/H01	ASTM D642; TAPPI T804-OM	Compression Resistance of Shipping Containers, Components, and Unit Loads
___	09/H02	ASTM D895; TAPPI T805-OM	Water Vapor Permeability of Packages
___	09/H05	ASTM D3611	Accelerated Aging of Pressure-Sensitive Tapes
___	09/H07	Method 5005.1	Cornerwise-Drop (Rotational) Test
___	09/H08	Method 5007.1; ASTM D5276; TAPPI T802-OM	Drop Test (Free Fall)
___	09/H09	Method 5008.1	Edgewise Drop (Rotational) Test
___	09/H10	Method 5009.2	Leaks in Containers
___	09/H11	Method 5011.1	Mechanical Handling Test
___	09/H12	Method 5012	Pendulum-Impact Test

___	09/H13	ASTM D782	Shipping Containers in Revolving Hexagonal Drum
___	09/H14	Method 5014	Rollover Test
___	09/H16	Method 5016.1	Superimposed-Load Test (Stackability, with Dunnage)
___	09/H17	Method 5017	Superimposed-Load Test (Uniformly Distributed, Without Dunnage)
___	09/H18	Method 5018	Tipover Test
___	09/H19	Method 5019.1; TAPPI T817-OM/A; ASTM D999/A	Vibration (Repetitive Shock) Test
___	09/H20	Method 5020.1; TAPPI T817-OM/B,C; ASTM D999/B,C	Vibration (Sinusoidal Motion) Test
___	09/H21	Method 5023; TAPPI T801-OM; ASTM D880	Incline-Impact Test
___	09/H22	TAPPI T805-OM	Water Resistance of Fiberboard Shipping Containers (Spray Method)
___	09/H24	TAPPI T802-OM	Drop Test for Fiberboard Shipping Containers
___	09/H25	TAPPI T803-OM	Puncture and Stiffness Test of Container Board
___	09/H26	TAPPI UM-807	Wet Shear Adhesion Test of Corrugated Fiberboard (MBR)
___	09/H27	TAPPI T808-OM	Flat Crush Test of Corrugated Board (Flexible Beam Method)
___	09/H28	TAPPI T810-OM	Bursting Strength of Corrugated and Solid Fiberboard
___	09/H29	TAPPI T811-OM	Edgewise Compressive Strength of Corrugated Fiberboard (Short Column Test)
___	09/H30	TAPPI T821-OM	Pin Adhesion of Corrugated Board by Selective Separation

Pulp

___	09/J01	TAPPI T525-OM	Diffuse Brightness of Pulp (d/O Degree)
___	09/J02	TAPPI T220-OM	Physical Testing of Pulp Handsheets (Requires accreditation for 09/E02, 09/E03, 09/E06, 09/E08, 09/E09, 09/E17)

PLASTICS

___	15/A01	ASTM D256	Pendulum Impact Resistance of Notched Specimens of Plastics
___	15/A02	ASTM D471	Rubber Property - Effect of Liquids
___	15/A03	ASTM C581	Chemical Resistance of Thermosetting Resins Used in Glass Fiber Reinforced Structures Intended for Liquid Service
___	15/A04	ASTM D618	Conditioning Plastics and Electrical Insulating Materials for Testing
___	15/A05	ASTM D635	Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position
___	15/A06	ASTM D638	Tensile Properties of Plastics
___	15/A07	ASTM D696	Coefficient of Linear Thermal Expansion of Plastics
___	15/A08	ASTM D695	Compressive Properties of Rigid Plastics
___	15/A09	ASTM D746	Brittleness Temperature of Plastics and Elastomers by Impact
___	15/A10	ASTM D790	Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
___	15/A11	ASTM D794	Permanent Effect of Heat on Plastics
___	15/A12	ASTM D999	Vibration Testing of Shipping Containers
___	15/A13	ASTM D1042	Linear Dimensional Changes of Plastics
___	15/A14	ASTM D1435	Outdoor Weathering of Plastics
___	15/A15	ASTM D1525	Vicat Softening Temperature of Plastics
___	15/A16	ASTM D1708	Tensile Properties of Plastics by Use of Microtensile Specimens
___	15/A17	ASTM D2561	Environmental Stress-Crack Resistance of Blow-Molded Polyethylene Containers
___	15/A18	ASTM D2565	Operating Xenon Arc-Type Light-Exposure Apparatus With and Without Water for Exposure of Plastics

___	15/A19	ASTM D2583	Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
___	15/A20	ASTM D2584	Ignition Loss of Cured Reinforced Resins
___	15/A21	ASTM G23	Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials

PLUMBING - PLASTICS AND FIXTURES

Plastics

___	19/P01	ANSI Z124.1 (Sec. 4, 5, 6)	Plastic Bathtub Units (Structural Integrity, Physical Characteristics and Material Tests)
___	19/P02	ANSI Z124.2 (Sec. 4, 5, 6)	Plastic Shower Receptors-Stalls (Structural Integrity, Physical Characteristics and Materials Tests)
___	19/P03	ANSI Z124.3 (Sec. 4, 5, 6)	Plastic Lavatories (Structural Integrity, Physical Characteristics and Materials Tests)
___	19/P04	ASTM Z124.4 (Sec. 4, 5)	Plastic Water Closet Bowls and Tanks (Structural Integrity and Physical Characteristics)

Plastic Water Closet Fixture Performance

___	19/P05	ANSI Z124.4 (Sec. 8) per ANSI A112.19.6M (Sec. 7.1)*	Plastic Water Closet Bowls and Tanks (Sanitary and Hydraulic Performance of Water Closet Tanks and Bowls)

* Requires laboratory accreditation for Hydraulic Performance Test Methods, 19/W01-19/W08. Check here if accreditation is requested for 19/P05.

Fixtures

___	19/F01	ASME A112.18.1M (Sec. 5.2)	Plumbing Fixture Fittings (Coatings, Electrodeposited and Organic Tests)
___	19/F02	ASME A112.18.1M (Sec. 5.14)	Plumbing Fixture Fittings (Temperature and Pressure Compensating Mixing Valves)
___	19/F03	ASME A112.18.1M (Sec. 6.2)	Plumbing Fixture Fittings (Strength Tests; Burst, Bending, Thread Torque, and Spout)
___	19/F04	ASME A112.18.1M (Sec. 6.4)	Plumbing Fixture Fittings (Valve Closure Test)
___	19/F05	ASME A112.18.1M (Sec. 6.5)	Plumbing Fixture Fittings (Flow Capacity)
___	19/F06	ASME A112.18.1M (Sec. 6.6)	Plumbing Fixture Fittings (Life Test)
___	19/F07	ASME A112.18.1M (Sec. 6.7)	Plumbing Fixture Fittings (High Temperature Extreme)
___	19/F08	ASME A112.18.1M (Sec. 6.8)	Plumbing Fixture Fittings (Intermittent Shock)
___	19/F09	ASME A112.18.1M (Sec. 5.13, 6.9)	Plumbing Fixture Fittings (Backflow Prevention Tests)

Vitreous China Plumbing Fixtures

___	19/V01	ASME A112.19.2M (Sec. 7.1)	Vitreous China Plumbing Fixtures (Absorption - Boiling)
___	19/V02	ASME A112.19.2M (Sec. 7.2)	Vitreous China Plumbing Fixtures (Crazing)
___	19/V03	ASME A112.19.2M (Sec. 7.3)	Vitreous China Plumbing Fixtures (Warpage)
___	19/V04	ASME A112.19.2M (Sec. 7.4)	Vitreous China Plumbing Fixtures (Load Tests-Wall Hung Products)
___	19/V05	ASME A112.19.2M (Sec. 7.5)	Vitreous China Plumbing Fixtures (Insulated Tank)
___	19/V06	ASME A112.19.2M (Sec. 7.7)	Vitreous China Plumbing Fixtures (Closet Auger)

Hydraulic Performance for Water Closets and Urinals

NOTE: If 19/P05, Plastic Water Closet Fixture Performance, is checked, test methods from ASME A112.19.6 are required and must be selected below for Hydraulic Performance Test Methods.

___	19/W01	ASME A112.19.6 (Sec. 7.1.2)	Laboratory Tests for Waste Removal and Water Consumption (Test Apparatus and General Instructions)
___	19/W02	ASME A112.19.6 (Sec. 7.1.3)	Laboratory Tests for Waste Removal and Water Consumption (Removal of Solids)
___	19/W03	ASME A112.19.6 (Sec. 7.1.4)	Laboratory Tests for Waste Removal and Water Consumption (Washing of Flushing Surface-Rim Wash)
___	19/W04	ASME A112.19.6 (Sec. 7.1.5)	Laboratory Tests for Waste Removal and Water Consumption (Removal of Waste Liquids-Water Change)
___	19/W05	ASME A112.19.6 (Sec. 7.1.6)	Laboratory Tests for Waste Removal and Water Consumption (Water Consumption and Hydraulic Characteristics)
___	19/W06	ASME A112.19.6 (Sec. 7.1.8)	Laboratory Tests for Waste Removal and Water Consumption (Drainline Transport Characterization Procedure)
___	19/W07	ASME A112.19.6 (Sec. 7.1.9)	Laboratory Tests for Waste Removal and Water Consumption (Water Rise)
___	19/W08	ASME A112.19.6 (Sec. 7.1.10)	Laboratory Tests for Waste Removal and Water Consumption (Back Pressure Test)

BUILDING SEALS AND SEALANTS

___	13/O01	ASTM C510	Staining and Color Change of Single- or Multicomponent Joint Sealants
___	13/O02	ASTM C603	Extrusion Rate and Application Life of Elastomeric Sealants
___	13/O03	ASTM C639	Rheological (Flow) Properties of Elastomeric Sealants
___	13/O04	ASTM C661	Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer
___	13/O05	ASTM C679	Tack-Free Time of Elastomeric Sealants
___	13/O06	ASTM C681	Volatility of Oil- and Resin-Based, Knife-Grade, Channel Glazing Compounds
___	13/O07	ASTM C711	Low-Temperature Flexibility and Tenacity of One-Part, Elastomeric, Solvent-Release Type Sealants
___	13/O08	ASTM C712	Bubbling of One-Part, Elastomeric, Solvent-Release Type Sealants
___	13/O09	ASTM C713	Slump of an Oil-Based, Knife-Grade, Channel Glazing Compound
___	13/O10	ASTM C718	Ultraviolet (UV)-Cold Box Exposure of One-Part, Elastomeric, Solvent-Release Type Sealants
___	13/O11	ASTM C719	Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)
___	13/O12	ASTM C731	Extrudability, After Package Aging, of Latex Sealants
___	13/O13	ASTM C732	Aging Effects of Artificial Weathering on Latex Sealing Compounds
___	13/O14	ASTM C733	Volume Shrinkage of Latex Sealing
___	13/O15	ASTM C734	Low-Temperature Flexibility of Latex Sealing Compounds After Artificial Weathering
___	13/O16	ASTM C736	Extension-Recovery and Adhesion of Latex Sealants

___	13/O17	ASTM C741	Accelerated Aging of Wood Sash Face Glazing Compound
___	13/O18	ASTM C742	Degree of Set for Wood Sash Glazing Compound
___	13/O19	ASTM C792	Effects of Heat Aging on Weight Loss, Cracking, and Chalking of Elastomeric Sealants
___	13/O20	ASTM C793	Effects of Accelerated Weathering on Elastomeric Joint Sealants
___	13/O21	ASTM C794	Adhesion-in-Peel of Elastomeric Joint Sealants
___	13/O22	ASTM C910	Bond and Cohesion of One-Part Elastomeric Solvent Release-Type Sealants
___	13/O23	ASTM D2202	Slump of Sealants
___	13/O24	ASTM D2203	Staining from Sealants
___	13/O25	ASTM D2376	Slump of Face Glazing and Bedding Compounds on Metal Sash
___	13/O26	ASTM D2377	Tack-Free Time of Caulking Compounds and Sealants
___	13/O27	ASTM D2450	Bond of Oil- and Resin-Base Caulking Compounds
___	13/O28	ASTM D2451	Degree of Set for Glazing Compounds on Metal Sash
___	13/O29	ASTM D2452	Extrudability of Oil- and Resin-Base Caulking Compounds
___	13/O30	ASTM D2453	Shrinkage and Tenacity of Oil- and Resin-Base Caulking Compounds

___ Total number of test methods selected on this application.

___ If test method code 19/P05 (Plastic Water Closet Fixture Performance) is checked, subtract one (1) from the above total.

___ **ADJUSTED TOTAL** (Enter here and on Line 5b of the NVLAP Fee Calculation Worksheet for Commercial Products Testing-Paints, Paper, Plastics, Plumbing, and Seals/Sealants.)

APPENDIX E

CRITICAL ELEMENTS

CRITICAL ELEMENTS

DESCRIPTION: "Critical elements" are summary statements of key provisions from standard test methods. These summaries are provided to the Technical Experts for use during on-site assessments, as part of their operation manual. This appendix shows the format of a critical element summary, but the critical elements for the Commercial Products Testing program are not included in this handbook.

PURPOSE: Critical elements assist the assessors in uniformly and objectively conducting their evaluations. The critical elements provide guidance for a common basis to be applied by individual assessors in conducting on-site evaluations. They are *not* intended to be replacements for the written test procedures issued by standards-development organizations.

FORMAT OUTLINE: Typically, the critical element summary includes the headings listed below. The explanatory comments given below indicate the type of information summarized under each heading.

PROGRAM TITLE: The title of the specific NVLAP program; in the present case, the CPT Program.

NVLAP TEST METHOD CODE: The code for each test method given on the Test Method Selection List for the specific NVLAP program.

TEST METHOD DESIGNATION: An alphanumeric designation assigned to the test method by the organization that issued the standard; for example, designations include ASTM, TAPPI, and ASME, in the case of the CPT Program.

SHORT TITLE: The title of the test method as given on the NVLAP Test Method Selection List.

ENVIRONMENTAL/SAMPLE AND CONDITIONING REQUIREMENTS: A summary of conditioning or other treatment to which the test specimen is subjected before the test is conducted.

TEST EQUIPMENT AND APPARATUS: A listing of the major equipment and apparatus that the laboratory needs to have available to conduct the test.

CALIBRATION(S): A summary of the calibration requirements delineated in the test method.

TESTING PROCEDURES: A summary of the main steps of the test method.

STANDARD TEST REPORT REQUIREMENTS: A listing of the items that the method requires the test operator to include in the test report.

SPECIAL CONSIDERATIONS: A listing of those aspects of the test method to which the NVLAP technical assessor must pay special attention during the on-site assessment.

APPENDIX F

ON-SITE ASSESSMENT - TEST METHOD REVIEW

NVLAP LAB CODE: [ ]

NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM

ON-SITE ASSESSMENT - TEST METHOD REVIEW

Instructions to the Assessor:

During the on-site visit you will be required to assess the laboratory's ability to conduct the specific test methods for which it has applied for accreditation. In some cases this will involve many test methods. You may not have sufficient time to perform an in-depth assessment of each method.

Use the attached sheets to indicate which test methods you assessed at the laboratory, and the extent of your assessment. Indicate whether you performed an in-depth review, including a full review of laboratory activities. These include sample control and preparation, procedure review, observation of actual testing, environmental control check, equipment review, calibration checks, record-keeping practices and report forms; or, that you observed selected items to determine that the laboratory demonstrated the ability to conduct the test.

The specific requirements for each test method are detailed in the CRITICAL ELEMENTS, the HANDBOOK, and/or the TEST METHOD. Any items required under "special considerations" will be described either in the CRITICAL ELEMENTS, special instructions below, or in other correspondence.

Fill out the ON-SITE ASSESSMENT - TEST METHOD REVIEW SUMMARY by writing in the test method designation. Indicate on the summary the DEPTH of the assessment for each test method you reviewed, using one of the symbols shown below:

OT - (Observed Test)
EA - (Examined Apparatus)
W/TT - (Walked/Talked Through)
LDP - (Listened to Description of Procedures)

All ***deficiencies*** must be accompanied by a comment.

Use the ON-SITE ASSESSMENT - TEST METHOD REVIEW COMMENTS AND DEFICIENCIES sheets to write comments on what you observed. Preface each comment with the test method designation to which the comment applies. Please be liberal with your comments so that we have a good written record of your observations; the more information we have, the better the accreditation decision we can make.

Special Instruction:

NVLAP LAB CODE:

National Voluntary Laboratory Accreditation Program (NVLAP)

ON-SITE ASSESSMENT - TEST METHOD REVIEW SUMMARY

Test Method (number, name or designation)	Depth of Assessment	Environmental/ Test Sample Conditioning	Test Equipment and Apparatus	Calibration	Test Procedures	Test Reports	Special Considerations

NVLAP LAB CODE: [ ]

ON-SITE ASSESSMENT - TEST METHOD REVIEW COMMENTS AND DEFICIENCIES

Instructions to the Assessor: Use this sheet to document comments and deficiencies. For each, identify the appropriate item number. Identify comments with a "C" and deficiencies with an "X." If additional space is needed, make copies of this page (or use additional blank sheets).

Item Number	*Comments and/or Deficiencies as Noted on the On-Site Assessment - Test Method Review Summary*

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